Vol. VI, No. 10 OCTOBER, 1951

AGRICULTURAL CHEMICALS

In This Issue:

National Agricultural Chemicals Association Meets

•

Fertilizer Potential in Grassland Program

•

Warfarin's First Year in Review

•

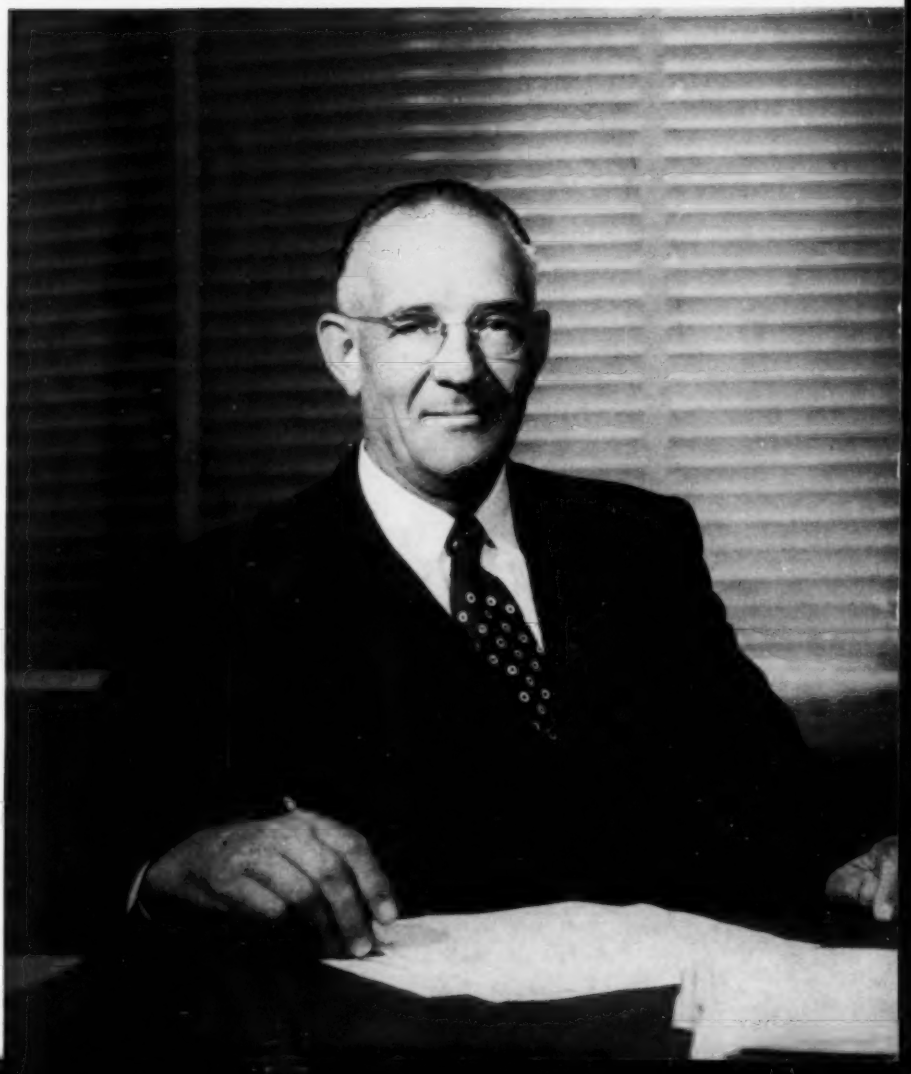
Amer. Chemical Society in Annual Meeting

•

Solid Nitrogen Needed

•

Research . . . Key to Pesticide Development



Cover photo: Arthur W. Mohr, newly-elected president, Nat'l Agricultural Chemicals Ass'n (See pages 5 and 31)

DON'T OVERLOOK THE OBVIOUS!

During times of uncertain supply, there is a tendency to focus all attention on the scarcer materials.

Don't let this prevent you from making the most of time-proved materials available to you *now!*

We suggest POWCO BRAND ROTENONE, supplied as Cube and Derris powders—pure ground root containing 4 to 6 percent pure rotenone and other active resins. It provides effective control of insects, yet offers NO TOXIC RESIDUE PROBLEMS.

Don't overlook the obvious!

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FOR A Firm '52 SEASON!

This is the "threshold period"—the time when pesticide dust formulators map next season's strategy after running a total on this year's results.

Logistics for '52 won't be easy. Scarcities loom, uncertainties are present, and infestation—as always—is an imponderable.

But out of the welter comes a constant—Attaclay! For here's a carrier and a diluent which—year after year, toxicant after toxicant—has proved its way to a high level of acceptance.

All this, of course, is not news to users of Attaclay. They *know* what it means to get top value for their diluent dollars. They'll keep Attaclay on the first team, using more and more of it, with never a worry about dependability.

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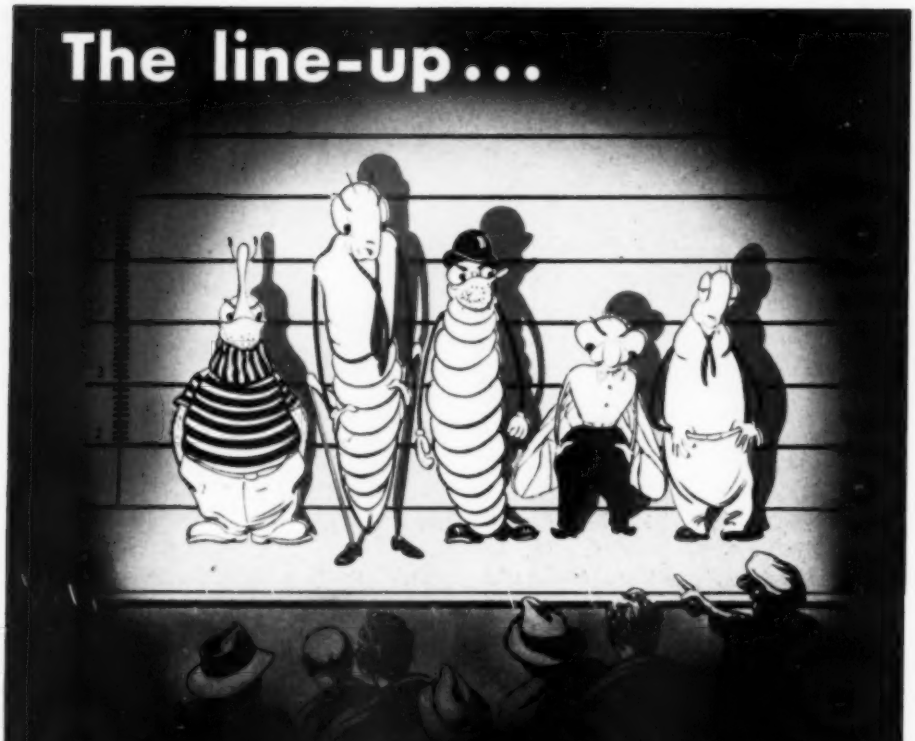

...of the nation's No. 1 crop enemies!

A gruesome group, isn't it!

They'll stop at nothing from picking your pocket to murder.

These hoods are all hardened criminals with records on county agents' "blotters" from coast-to-coast. They've been victimizing the farmers for years and their take runs into millions of dollars.

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Here are the "goods" you need to prosecute the bugland syndicate to the fullest:

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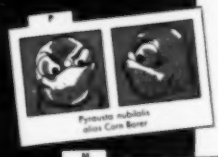
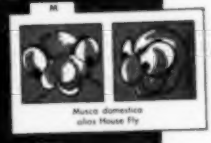
Copper	PCP	2, 4-D
DDT	Purified DDT	2, 4, 5-T





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AGRICULTURAL CHEMICALS

THIS MONTH'S COVER

Meet Arthur W. Mohr, newly-elected president of the National Agricultural Chemicals Association. Mr. Mohr is president of the California Spray-Chemical Corp., Richmond, Calif. He has been interested and active in the betterment of agriculture through the use of chemicals.

VOL. VI No. 10

OCTOBER 1951

In This Issue:

Editorials	29
Nat'l Agricultural Chemicals Ass'n Meets	31
Grassland, Vast Fertilizer Sales Potential *By J. R. Taylor, Jr.*	37
Warfarin Completes its First Year *By Ward Ross*	39
Problems of Insecticide Industry *By Dr. H. L. Haller*	42
More Nitrogen; More Solid Fertilizer *By W. A. Minor*	45
NFA Group on Midwestern Tour	46
Research, Basis of Pesticide Advancement *By P. H. Groggins*	49
American Chemical Society Meets	53
Nat'l Fertilizer Association to Atlanta	59
Listening Post *By Paul R. Miller & Kelvin Dorward*	61
Suppliers Bulletins	67
Technical Briefs	69
Industry News	73
Meeting Calendar	74
Washington Report	79
Classified Advertising	104
Advertisers Index	105
Tale Ends	106

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A Monthly Magazine For the Trade

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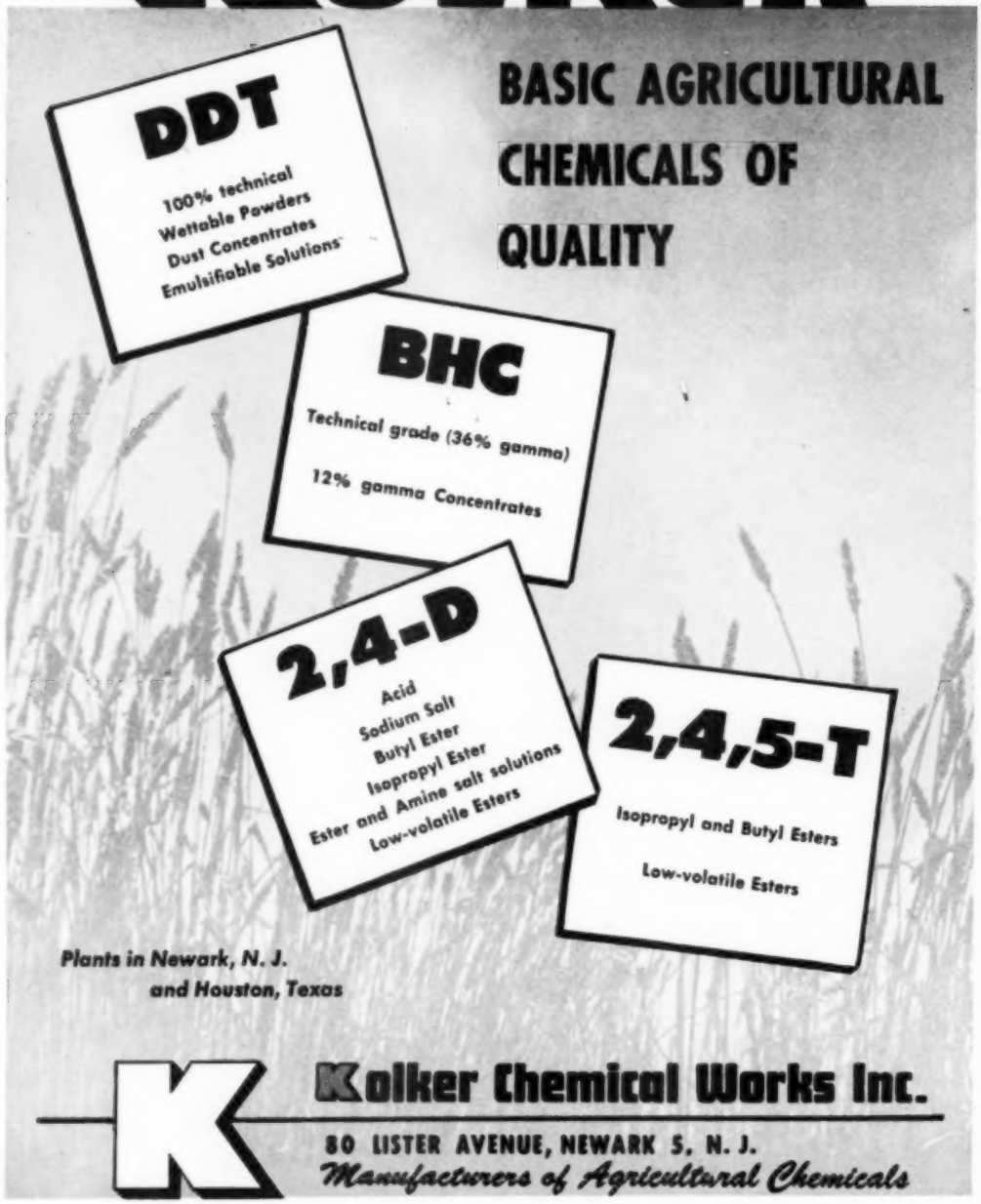
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ANHYDROUS AMMONIA—Tank car shipments of Anhydrous Ammonia (82% nitrogen) go out to Phillips contract customers from Phillips production facilities in the Texas Panhandle. Write our nearest district office for full information.

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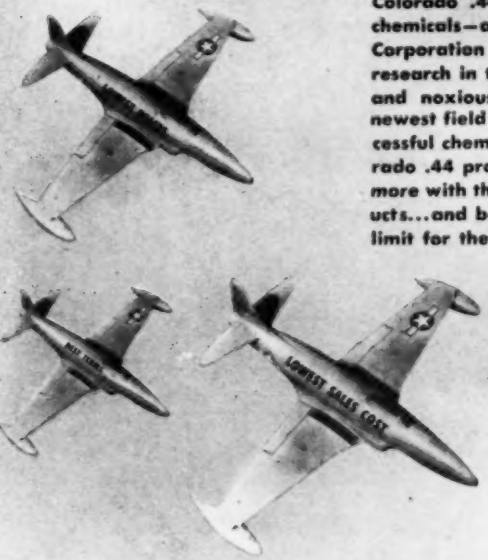

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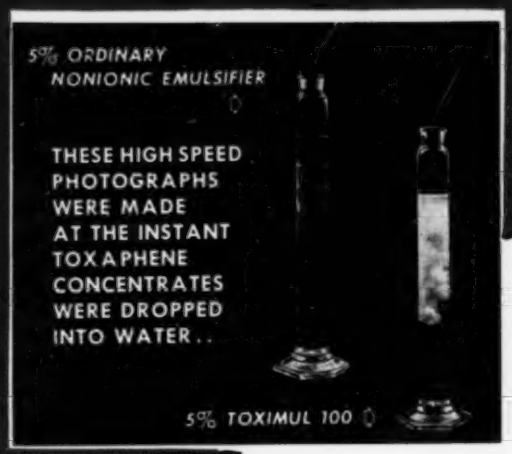

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a balanced anionic emulsifier for agricultural insecticides

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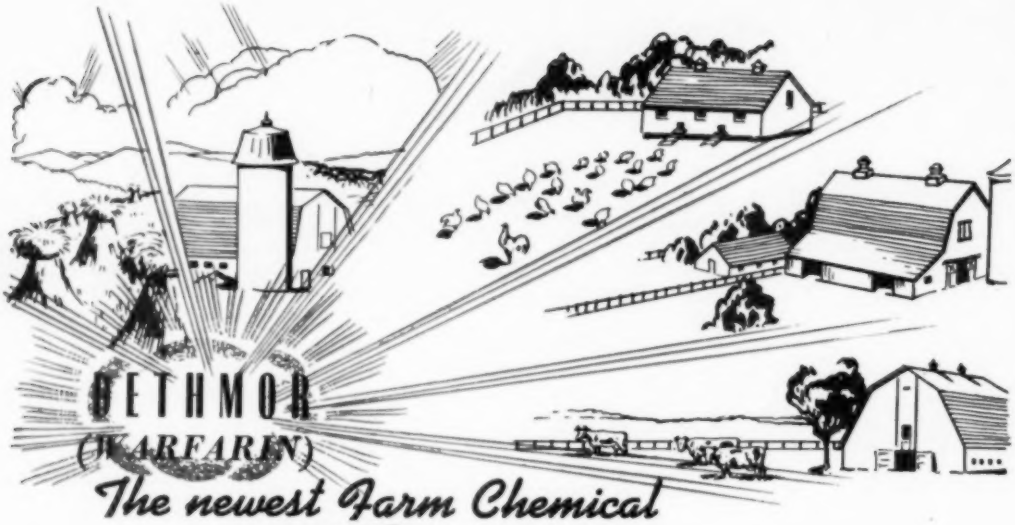

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NOTE: For those who prefer to distribute an established small package line—write for our list of repackers.

Our warfarin product Dethmor is sold in bulk to repackers for sale under private label. Most distributors also offer finished (ready-to-use) bait.

★

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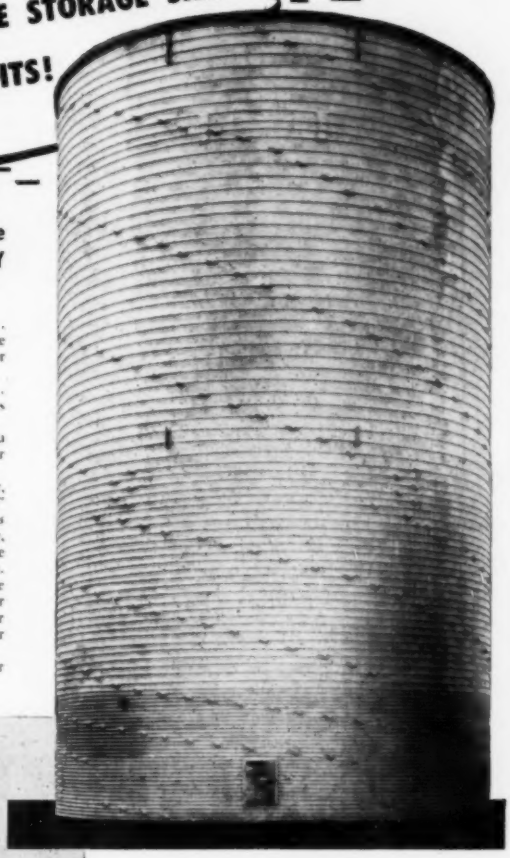

Marietta Air-Cell silos resist fire, acid, moisture . . . Keep AGRICULTURAL CHEMICALS BONE DRY . . . fully protected.

Outside, a Marietta silo is fire-proof, destruction-proof . . . constructed of lightweight, high strength Air-Cell concrete that is rust-proof, maintenance-free . . . designed to lower insurance costs.

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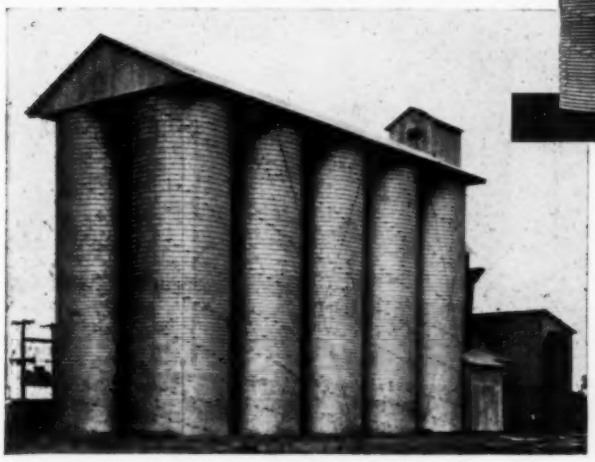

Left above: This modern installation at North Little Rock, Arkansas, consists of 10 Marietta Air-Cell tanks and shows how they can be combined into an efficient, economical storage system. Right above: This Air-Cell silo erected by Marietta for the Tennessee Corporation at New Albany, Indiana, is used to store phosphate rock. It is 30 feet in diameter, 50 feet in height, and has a capacity of 1500 tons. The silo is equipped with a suspended steel hopper to feed pulverizer in fertilizer plant.

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- *Fire-proof* . . . resists fire and the elements, keeps content safe.
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LION provides one-stop nitrogen service to Southern fertilizer manufacturers

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– put Pyrenone in your formulation

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Put Pyrenone in your formulation to give it an unbeatable combination of advantages for your customer, the dairy farmer–

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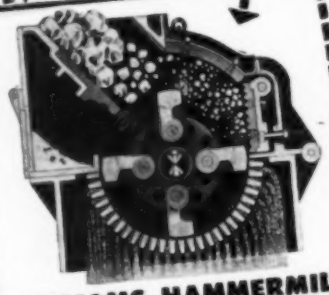
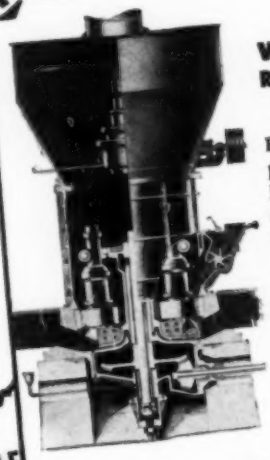


WILLIAMS HAMMERMILLS

Heavy duty for crushing and grinding rock phosphate, gypsum, limestone and similar materials.

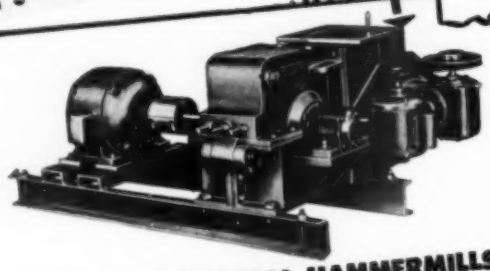
Also for disintegrating ammonium sulphate lumps and fertilizer mixes that "set-up" in storage.



WILLIAMS ROLLER MILLS WITH AIR SEPARATION

For pulverizing rock phosphate, gypsum, limestone, sulphur for dusting, etc. Used for blending and pulverizing insecticide mixes such as BHC, DDT, and toxaphene but in higher concentrations than Hammermills will handle.

WCR1-9



WILLIAMS HELIX-SEAL HAMMERMILLS

For grinding, disintegrating and blending insecticide mixes, such as BHC, DDT, toxaphene, etc., in concentrations ready for use.

W.T./M.G.P.*

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Pittsburgh* 10-20 BRUSH KILLER

*Standard for Quality

with LOW VOLATILE THFE of 2,4-D and 2,4,5-T†

(Tetrahydrofurfuryl Esters)

†U.S. PATENTS PENDING

Now is the time, when the big planting and growing seasons are out of the way, that attention is turned to brush clearance of pastures, ditches, fence rows, etc.

Pittsburgh 10-20 Brush Killer, with low volatile THFE (Tetrahydrofurfuryl Esters) of 2,4-D and 2,4,5-T is designed to assure thorough killing action on woody growth that is resistant to 2,4-D alone.

Dealers can assure their customers of effective killing action, with added safety to nearby valuable crops or plants, when 10-20 Brush Killer is used on:

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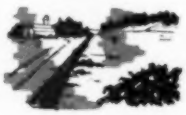
Barberry, Colorado	Elm	Osage Orange	Sumac
Birch	Gum, Black	Pine	Sweet Fern
Blackberry	Gum, Sweet	Poison Ivy	Sycamore
Buckbrush	Hackberry	Poison Oak	Tea, New Jersey
Catalpa	Hawthorn	Poplar	Tree of Heaven
Cedar, Salt	Hazel	Prickly Ash	Trumpet Vine
Cherry, Choke	Hercules'-Club	Raspberry	Tulip Tree
Cherry, Wild	Honeysuckle	Rose, Cherokee	Virginia Creeper
Chestnut	Hornbeam	Sagebrush	Walnut
Chinaberry	Horse Chestnut	Shadbush	Willow
Cottonwood	Juneberry	Sassafras	Winterberry
Currant	Locust, Black	Silverberry	Witch Hazel

PASTURES AND RANGELAND

FENCE ROWS



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WEED KILLERS: 2,4-D Acid, 2,4-D Amine Concentrates, 2,4-D Ester Formulated Concentrates, 2,4-D Sodium Salt Monohydrate, 2,4,5-T Formulations.

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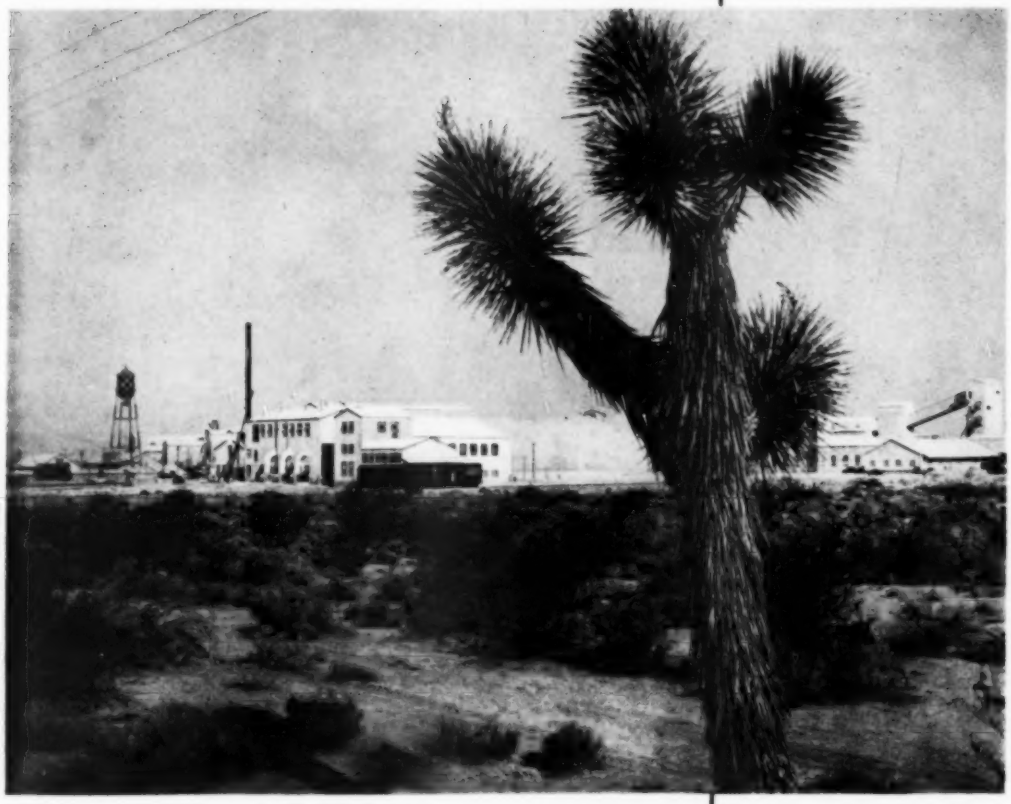

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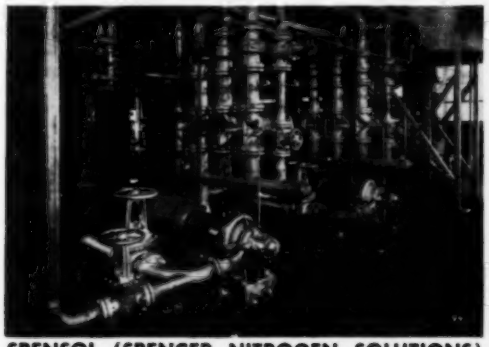

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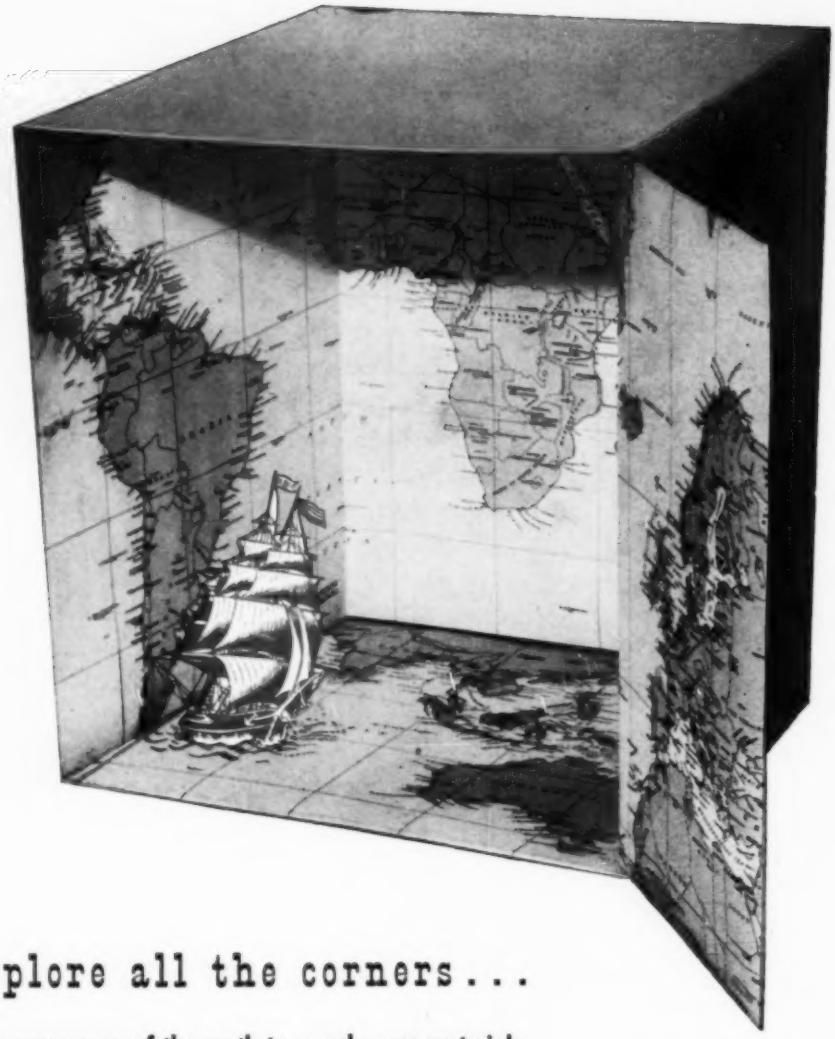

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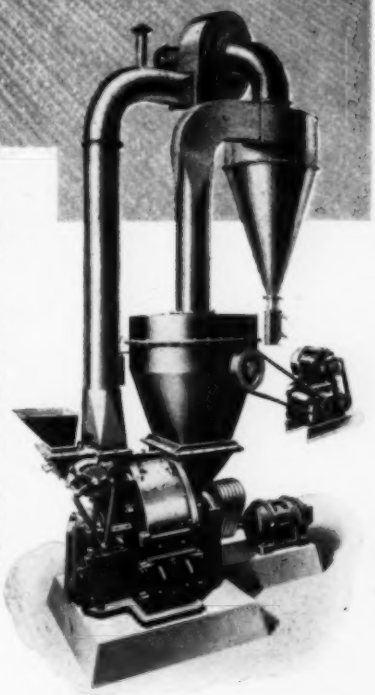

Due to its practical operating features, the Raymond Whizzer-equipped IMP MILL has become widely used in agricultural chemical plants, especially for the production of blended field strength insecticides and low concentrate formulations.

This hammer-type mill produces fine, uniform, fluffy finished materials, well adapted for dusting applications. The air separation system, used for classifying and conveying, provides a cooling medium for removing heat generated in pulverizing. Lower mill temperatures permit greatly extended operating periods without shutdowns.

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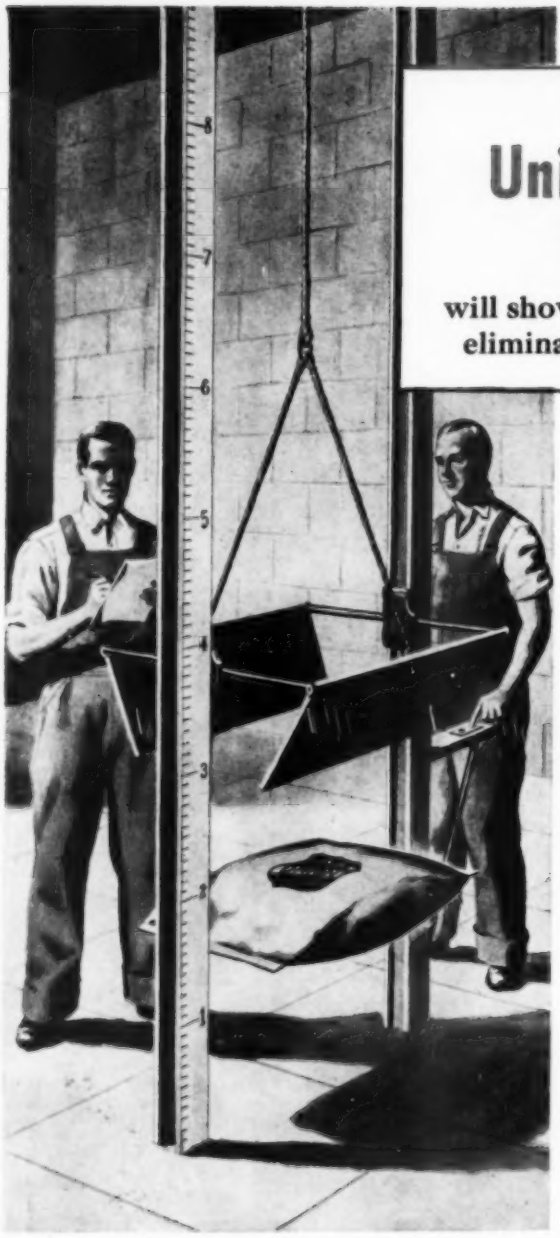

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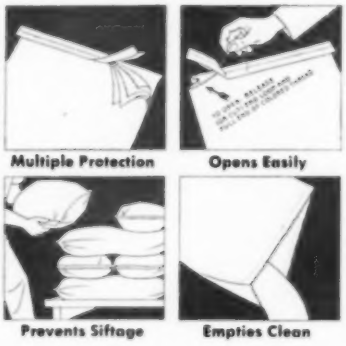

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TRADE MARK UNION

THE EDITOR COMMENTS

REPORTS from the sales front indicate that while most firms handling agricultural insecticides had a better year in 1951 than in 1950, volume did not reach anticipated levels during the second half of the season. The reasons are two. First, drought, extremely hot weather and unfavorable growing conditions in some areas limited some crops, particularly cotton. Second, the industry's campaign to get users of insecticides to anticipate their requirements, and buy in advance, was apparently quite a success. Remembering only too well their inability to get needed supplies of insecticides during the 1950 season, users were generally only too willing to go into the market in advance of the 1951 season, and a lot of buying was done last winter and early spring.

In many such cases buying was done at firm prices, and when, late in the season, quotations were found to have eased off in the spot market, some buyers were understandably a little unhappy over their misreading the market. Gambling that prices might go higher, and looking to protect themselves against this possibility, as well as assuring availability of the materials they might need, they found the market lower instead.

To such buyers, about all one can say is that plenty of people have guessed wrong on markets before. Their most important objective, however, assuring themselves of adequate supplies of insecticides at a fair price, was accomplished. It is really a matter of relatively small importance whether the cost of this insurance advanced or declined a little toward the end of the season. And, for 1952, and the future, particularly so long as present emergency conditions prevail, a continuance of this policy of forward buying is strongly to be recommended. The intelligent grower will provide himself with this same kind of insurance for 1952. He will order and take delivery on a substantial part of his anticipated future needs as early as his financial and other conditions will permit, avoiding the serious dangers of speculating and trying to outguess the market.

We hazard the guess, however, that for the 1952 season there will be more buying on the basis of "market price at time of delivery" rather than at specific dollars and cents figures which so many buyers took this past season.

SAFETY is the business of everyone who handles or works with pesticides. It is no secret that when improperly handled, these efficient insecticides can become dangerous to the careless person. Much of the literature on safety has pointed out the perils of parathion, with Dr. Herman King of Michigan State College going so far as to warn a horticultural group that "You bet your life when you take a chance."

Another significant development along this line is the establishment, by the University of Washington, of a new Environment Research Laboratory where a staff under Dr. J. I. Sealey will work with agriculture and industry in studying health hazards from industrial and agricultural chemicals. Part of this work, of course, is to embrace special studies on parathion.

But it is not alone in connection with use of parathion that precautions are needed. More attention to safety in use can very logically be recommended by every one having any thing to do with handling and application of insecticides. As a matter of fact, the producers of parathion have done perhaps the best job of any insecticide manufacturer in calling attention to the hazards necessarily connected with the use of this highly valuable, although toxic, insecticidal weapon, and have preached safety all along the line. It is largely because of this safety campaign on parathion that it has been possible to do an outstanding job of crop protection with this product, with such a relatively small number of poisoning cases.

Without pointing the finger at any one in particular, but at everybody in general, we feel

that the sale of safety ideas to *all users* of insecticides, fungicides, and herbicides has not been too well done. From our own observation, the average farm worker remains unimpressed on the subject of safety and is on the whole grossly careless or ignorant. The sales job on respirators and masks, both by their makers and local dealers, has not been very strong. Warning advice by government and local advisors has not been such as to be heeded fully. And the boss farmer, as well as his worker, is too prone to view respirators and other protective equipment as sissy stuff.

As long as humans use insecticides, we imagine that 100% observation of safety will never be attained. But, we feel that it can be a lot better than it is today. The job, we are sure, has got to be done at the level of the local dealer and the farm operator. As far as we can see, the insecticide manufacturer is doing his part. But for the good of the entire industry, we urge that means for further safety education be given another going over now.

THE proposal that manufacturers of agricultural chemicals must depend to a substantial extent on use of returnable drums for future shipments is one of those ideas that could originate only in Washington. Whoever thought up the idea probably sees no reason why it can't be made to work.

Just for the record, we will list a few of the reasons why use of returnable drums for agricultural chemicals is highly impractical. First, there is 2,4-D. People in the agricultural chemical field have had to learn the hard way that once 2,4-D has been shipped in a container, it is useless for other products. Insignificant traces of the potent weedicide are still sufficient to contaminate subsequent materials packed in the same container, with possible serious damage to crops.

Many agricultural insecticides must be packed in lacquer-lined containers to protect the emulsions against contact with metal. A pin-prick break in the lacquer is sufficient to start a reaction which may break down the product. Re-using such containers is not really practical. As a matter of fact, it is a little bit difficult to envision the re-use of any small chemical container.

Imagine the condition of a five-gallon container of cattle dip after it has been shipped out to some ranch, the contents used, the container battered, allowed to rust a few months, then shipped back to the plant. How many such containers would ever be returned, — and how many of them would be in any condition even remotely resembling usable?

No, the whole idea is impractical! And not only impractical, but downright dangerous, and potentially wasteful of our essential agricultural crops!

WHAT is behind the broad pro and con claims of the organic farmers? The answer is simple and provable: Bunk. The above quotation is not our own, but is typical of many contained in a highly-gratifying article by R. I. Throckmorton, Dean of Kansas State College, in the September *Country Gentleman*. Under the title "The Organic Farming Myth," Dean Throckmorton proceeds systematically to tear to shreds the fanaticism of the anti-fertilizer group which he describes as a "cult of misguided people".

Quoting from eminent authorities, Mr. Throckmorton emphasizes that there is no evidence whatever to indicate that chemically fertilized plants are less nutritious than non-fertilized, as the organic proponents insist. Nor is there any substance to the claim that chemical fertilizers are injurious to the health of man or beast. According to Dr. W. M. Fifield of the Florida Agricultural Experiment Station, "Not a single instance has been called to our attention where the use of chemicals in production or protection of our state's crops or livestock has resulted in harmful effects on humans who have consumed them."

"If commercial fertilizers did poison the soil, one would expect their continued use to result in a material reduction in crop yields", the writer continues. But this has decidedly never been the case. Rather, these fertilizers have "pointed the way to steadily increased yields of higher quality,

(*Continued in Green Section, opposite page* 83)

NAC Ass'n. President
ARTHUR W. MOHR

NAC Names Mohr President; hears representatives of government and industry discuss

PESTICIDE SITUATION

WITH an attendance of 425, the largest registration ever recorded in the Association's history, the 18th annual meeting of the National Agricultural Chemicals Association was held at the Essex and Sussex Hotel, Spring Lake, N. J., September 5-7. Representatives of the U. S. Department of Agriculture, the National Production Authority, and the industry were represented on the program which covered a wide area of activity in the pesticide field.

The NACA elected as president for a two-year term, A. W. Mohr, president, California Spray Chemical Corp., Richmond Calif. Mr. Mohr succeeds Ernest Hart, president, Niagara Chemical Division of Food Machinery Corp., Middleport, N. Y. Other officers named at the meeting were: Paul Mayfield, Hercules Powder Co., Wilmington, Del., vice-president and Lea S. Hitchner was re-elected executive secretary and treasurer of the Association.

In his annual address, president Hart told the group that the 1951 production of pesticide materials will exceed a billion pounds, and that prospects for the coming year point to even greater production providing necessary raw materials are available. His address (published in full in our September issue, pages 38-40) was presented on the opening morning of the convention before an overflow crowd in the hotel's ballroom.

Lea S. Hitchner, executive secretary and treasurer of the Association presented his annual report following Mr. Hart's talk. Mr. Hitchner reviewed the progress of the past year emphasizing the Association's growth in membership and its efforts to keep production of pest control materials at a high level. He stated that all of the services instituted by the Association in the past, will be continued, including the pest reporting service, the Defense Order reporting service, and general bulletins.

The problem of getting sufficient numbers of containers for shipment of agricultural chemicals is being studied by a new committee, he said, and particular efforts are being put forth to increase the supply of steel drums. Arrangements are being made to mark drums used for 2,4-D to avoid accidental re-use by other chemicals, to the possible detriment of crops.

The secretary announced also that a Grasslands Committee is being formed to study pest control problems in this connection, in cooperation with the U. S. Department of Agriculture and the Department of State. A Speaker's Bureau is also being established as a means of conveying the pest control story to the public through horticultural meetings and the like.

Two scheduled speakers of the first morning's program were unable to be present at the meeting. They were Thomas H. McCormack, Chief, Rubber, Chemicals and Drugs Division, Economic Stabilization Authority, OPS, Washington, D. C. and L. B. Taylor, Director of the Office of Materials and Facilities, PMA, U. S. Dept. of Agriculture, Washington, D. C.

Howard J. Grady, chief, Agricultural Chemicals Section, Rubber, Chemicals and Drugs Division, ESA, OPS, presented to the group a picture of the Washington scene, pointing out in a humorous vein some of the confusing situations developing in the capital.

He recalled briefly the history of the OPS and its efforts to slow the inflationary trend, pointing out also the supplementary regulations issued to straighten out the unavoidable inequities arising from the earlier price freeze.

"CPR 22 was issued to cover manufacturers, giving relief to those who had voluntarily held the line and were being penalized, as well as to roll back prices of those manufacturers who had advanced prices beyond their normal profit ratios," Mr. Grady explained.

"The effect of this regulation upon the pesticide industry is difficult to determine accurately," he contin-

ued. "However, it is obvious that there will be some variation in ceiling prices from manufacturer to manufacturer since each one's base period price, materials and labor cost (which determine the ceiling price) will be different for each company." That the problems of establishing ceiling prices for the pesticide industry are more complicated than those of many other industries, was noted by the speaker. One factor is the seasonal aspect of the business and another is that many smaller formulators do not have accounting departments sufficient to gather the necessary information.

Mr. Grady called upon the industry for cooperation with the OPS in an effort to issue regulations that will be fair to everyone. "OPS, working under time pressures and with limited personnel, tries to develop regulations that will not require an army of people to administer or enforce," he said. "But if we are to issue this type of regulation, one that will be fair to everyone, we cannot work alone. We must have the industry's cooperation."

He called for precise information to enable the working out of proper relationships with the general price stabilization program. "We want you to think about your problems in detail; to be prepared to meet them fairly and squarely, as we know you want us to do," he said.

Heavy Production Ahead

WILLIAM R. Allstetter, Deputy Director, Office of Materials and Facilities, PMA, U.S.D.A., told the convention that the outlook for agricultural production in 1952 is greater than ever before, and that ways will have to be found to make each acre produce more than formerly. Complications in attaining this objective are seen in the impending shortage of phosphate fertilizer, which means that other materials used in increasing the yield of crops, will have a bigger job to do. Important in this category, Mr. Allstetter said, is the application of pest control materials to prevent loss of valuable crops to insects and plant disease.

Mr. Allstetter discussed the serious shortage of steel drums for shipping agricultural chemicals and predicted that next year may see an increase of 25% in available drums for the industry. The most perplexing problem is that of returnable drums, he said.

The OMF deputy told of surveys made recently to determine the over-all need for agricultural chemicals throughout the country, reporting that information was obtained through three main channels. The U. S. Department of Agriculture estimates were used, as were estimates made by individual companies in the agricultural chemical field; and also the reports of technical committees reporting from the 48 states. He said that figures arrived at from the survey seem to be correct and expressed satisfaction at the way it had worked out. Every effort will be made to keep controls at a minimum, Mr. Allstetter promised the convention, and added that his office expects to proceed along the same general lines along which it has operated for the past year.

Introduced by chairman A. W. Mohr as "the man who traveled the greatest distance to attend the convention," Gus M. Oehm, Director of Public Relations, Pineapple Research Institute of Hawaii brought the group greetings of the users of American-made agricultural chemicals in Hawaii, and related briefly some of the problems involved in harvesting pineapple crops and getting them to market. He said that the industry had suffered serious setbacks because of labor difficulties which had caused losses of more than $3,000,000. Mr. Oehm, on

Directors Elected

While electing A. W. Mohr as president and Paul Mayfield vice-president, members of the NAC also named the following as members of the association's board of directors: W. W. Allen, manager, Agricultural Chemical Sales, Dow Chemical Company, Midland, Michigan; W. C. Bennett, president, Phelps-Dodge Refining Corporation, New York, New York; J. Hallam Boyd, executive vice-president, Commercial Chemical Company, Memphis, Tennessee; Ernest Hart, president, Niagara Chemical Division, Food Machinery & Chemical Corporation, Middleport, New York; Lea S. Hitchner, executive secretary, NAC Association, Washington, D. C.; John Paul Jones, assistant to general manager, Stauffer Chemical Company, New York, New York; George F. Leonard, executive vice-president & treasurer, Tobacco By-Products & Chemical Corporation, Richmond Virginia; Paul Mayfield, assistant general manager, Hercules Powder Company, Inc., Wilmington, Delaware; James McConnon, vice-president, McConnon & Company, Winona, Minnesota; A. W. Mohr, president, California Spray-Chemical Corporation, Richmond, California; E. H. Phillips, director of purchasing, GLF Soil Building Service, Division of Cooperative GLF Exchange, Inc., New York, New York; Fred Shanaman, president, Pennsylvania Salt Manufacturing Company of Washington, Tacoma, Washington; Russell B. Stoddard, coordinator of insecticide operations, U. S. Industrial Chemicals, Inc., New York, New York; F. S. Washburn, director, agricultural Chemical Division, American Cyanamid Company, New York, New York; and Byron P. Webster, vice-president, Chipman Chemical Company, Inc., Bound Brook, New Jersey.

In the Photos:

Top row, (L to R) Ernest Hart, Mrs. Hart, Middleport, N. Y.; and Kenneth Stuart, Colorado Fuel & Iron Corp., Ed. Georgi, Eastern States Coop. and W. R. Allstetter, U.S.D.A., Washington, Dr. W. G. Reed, U.S.D.A., Washington, and John A. Rodda, U.S.I. Chemicals, Inc., New York.

Second row: Scott James, New York and Howard Elmer, Charlotte, N. C., both of Pittsburgh Agricultural Chemical Co.; Harold Cunningham, Rohm & Haas Co., Philadelphia, M. C. Morton, Central Chemical Corp., Hagerstown, Md. and Harold Davies, Calabama Chemical Co., Huntsville, Ala. Wallace Moreland, Rutgers Univ., New Brunswick, N. J. and P. J. McManus, G L F, Ithaca, N. Y.

Third row: E. L. Thomas, E. H. Rappe and R. T. O'Neal, Swift & Co., Chicago, J. A. Singmaster, Monsanto Chemical Co., New York; Wm. Reeda, Jr., Crop-Saver Chemical Co., Inc., Arlington Hts., Ill. and J. Everett Bussart, Velsicol Corp., Chicago, E. S. Thayer, Emulsol Corp., New York; Eugene S. Heckathorn, Heckathorn & Co., Richmond, Calif., Sol Epstein, Emulsol Corp., Chicago, and Ed. Camson, Plant Food Products Co., Sayville, N. Y.

Bottom row: Part of NAC program committee: Carlos Kampmeier, Rohm & Haas Co., Philadelphia; George Kreiger, Ethyl Corp., New York; John A. Rodda and P. J. McManus, New NAC president, A. W. Mohr, at microphone during meeting, George R. Ferguson, Geigy Co., Inc., Bayonne N. J.; C. C. Alexander, Geigy Co., Inc., New York; and Mr. and Mrs. E. C. Gerdes, Geigy Co., Inc., Burlington, Iowa.

sabbatical leave, has been in Hawaii for the past three years. He was formerly a prominent member of the old Agricultural Insecticide and Fungicide Association, now the NAC Association.

Canners' Problems Aired

THAT the canning industry is "in the middle" on the residue problem in foods, was expressed by Dr. Charles H. Mahoney, Director, Raw products Division, of the National Canners Association. Dr. Mahoney declared that the application of both insecticides and fungicides is absolutely necessary in producing foods for canning, and that when the Food and Drug Administration tolerances are released, they will be sufficient to protect the public "adequately." The canning industry will do its best to remove all residues which might remain on foods, thus eliminating the possibility of contamination.

The speaker made a plea for cooperation between the pesticide industry and the canning industry, whereby representatives of each would work together to make exhaustive tests on different kinds of crops, gathering accurate data on the effect of pesticides under varying conditions.

Thursday's activities consisted of an open forum of NAC members discussing current problems including the Delaney Hearings, shortages of shipping containers, etc. E. H. Phillips, G.L.F. Cooperative, New York, was in charge of the discussion.

Dr. H. L. Haller, assistant chief, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, pointed out many of the steps through which a given pesticide must go before being placed on the market. He emphasized the difference between "toxicity" and "hazard," noting that the two terms are not synonymous. "Toxicity is the capacity of a substance to produce injury; hazard is the probability that injury will result from the use of the substance in the quantity and in the manner recommended," he said.

IN THE PHOTOS

Top row: L to R: L. G. Matthews, American Smelting & Refining Co., New York and Lea S. Hitchner, Washington, D. C., executive secretary and treasurer, NAC Association. C. M. Nabors, Flag Sulphur & Chemical Co., Tampa, Fla., Robert S. Thompson, Thompson-Hayward Chemical Co., Kansas City; and W. Mercer Rowe., Flag Sulphur & Chem. Co.

Second row: Joseph A. Noone, NAC Association; T. W. Collins, General Chemical Div., Allied Chemical & Dye Corp., New York; J. E. Bussart, Velsicol Corp., Chicago; J. F. Kirk, General Chemical Div., New York; J. I. Shafer, B. G. Pratt Co., Hackensack, N. J.; and J. H. Buchholz, Cooperative Seed & Farm Supply Service, Inc., Richmond, Va.

Registering at meeting is R. F. Byrnes, Rohm & Haas Co., Philadelphia. At the table (L to R) are: Nancy Ferguson and Mae Dunn, NAC Association, Washington; Henrietta Monigle, Hercules Powder Co., Wilmington, Del.; and Harold Cunningham, Rohm & Haas Co.

Third row: (L to R): Wm. K. Feustel, and Richard L. Stokes, R. T. Vanderbilt Co., New York; Richard Hartley; and Jack W. Moore, Floridin Co., Warren, Pa., Dr. H. L. Haller, assistant chief, Bureau of Entomology and Plant Quarantine, U.S.D.A., Washington; Dr. C. C. Alexander, Geigy Co., Inc., New York and Dr. Donald F. Starr, S. B. Penick & Co., New York

Lower row: Ted Reideburg, Reideburg & Associates, New York; R. W. Jones and H. R. Johnson, both of Triangle Chemical Co., Macon, Georgia, Attapulgus Clay Co. representatives Robert W. Wert and Mrs. Wert; Wm. M. Jarnagin and Mrs. Jarnagin; and Mr. and Mrs. C. Y. Haas.

Meeting Sidelights

ALL attendance records were broken again as members of the National Agricultural Chemicals Association met for their 18th annual meeting at Spring Lake, N. J. The capacity crowd had the old Essex and Sussex breaking out at the seams. Seats in the bar were at a premium, and chairs at most of the meeting sessions were just as scarce.

* * *

Claimant to the title of having come "furthest" to attend the meeting was Gus Oehm, who made it all the way from Hawaii. Runner-up was probably Pennsalt's Cameron Siddall, who journeyed from Washington State to attend.

* * *

There was a big delegation, too, from Texas, led into camp by P. J. Reno, of Hercules' Dallas office, and including Charlie Meadows of Southwest Sprayer & Chemical Co., John Chase of Port Fertilizer, and Tom Sammons of Hayes-Sammons.

* * *

"Pete" Petrus, though he hails from Monroe, La., Cotton States Chemicals headquarters, also wore a Texas sombrero. The whole gang from the southwest, incidentally, made the last fifty miles of their trip by taxi from the Newark airport, driving down in three cabs.

* * *

The advance guard was a bit slower to arrive than in previous years, but by Tuesday afternoon the beach was well populated, with Byron Webster having taken over his duties as lifeguard and George Krieger functioning as a floating dock. With the arrival of ex-pres. "Grub" Leonard, complete with white shoes, the meeting was declared in session.

"Grub", incidentally, brought with him a box of Coronas, to be presented to your agent on behalf of Frederico G. Morales, who was honored guest of the NACA at Miami last winter. Many thanks, senor Morales!

* * *

Some of the big attendance increase was supplied by representatives from the fertilizer field, emphasizing once more the community of interests between the two groups and the trend toward sale of agricultural insecticides by fertilizer firms. Among the fertilizer firms represented were Naco Fertilizer, Charleston, S.C., Louisiana Liquid Fertilizer Co., Port Fertilizer, Los Fresnos, Tex., Standard Fertilizer Co., Miller Chem. & Fertilizer, Baltimore, Michigan Fertilizer, Lansing, and Diamond Fertilizer Co., Sandusky.

* * *

Congratulations to the newest member of the NACA executive family, Paul Mayfield of Hercules Powder, billed by Ernie Hart in his introductory remarks at the annual banquet as the "Toxaphene King". Paul, one of Hercules' two "watch charm" size roving guards, seemed equally at home running a meeting session as he does in lighter moments in studying the racing form or rendering that famous aria, "Don't Give Me No Goose" from the light opera, "Christmas at Grandma's."

(Sidelights continued next page)

The assistant chief told of a comprehensive report now being assembled in the U.S.D.A., covering activities in the field of toxicology of the newer insecticides, fungicides and herbicides during the past several years. "The report will include the results obtained by the combined efforts of federal and state agencies in cooperation with commercial organizations on the effect of pesticidal chemicals on laboratory animals, livestock, fish and wildlife, beneficial insects and plants. The contamination of agricultural products with chemical residues is also considered in the report," he said.

Cooperative studies carried out by government-industry groups on a number of insecticidal materials, have been profitable, he told the group. "Those studies concerned themselves with the insecticidal chemical itself," Dr. Haller explained, and continued by describing benefits thus derived.

Philip H. Groggins, Chief of the Agricultural Chemicals Section Chemical Division, National Production Authority of the U. S. Department of Commerce, lauded the pesticide manufacturing industry for its assumption of responsibility for "exacting and time-consuming investigations to determine the hazards of new chemicals to man or beast that might arise from the handling of application of a pesticide or from eating foods or feeds containing spray residues."

Mr. Groggins hit at those who predict ill effects from using agricultural chemicals on food crops, stating that "a reasonable approach to the problem is to compare the demonstrable benefits stemming from the use of pesticides with conditions prior to their introduction; to weigh the incontrovertible evidence of better health and more abundant living against speculation and insinuation regarding possible ill effects."

DDT manufacturers were commended for their cooperation in conserving scarce materials and improving the efficiency of operations. "Because of the shortage of sulfur and sulfuric acid, it became apparent to producers of DDT that every effort would have to be made to recover their spent acid," he said. "According to advices from industry, practically every interested firm has already taken such action or is now taking steps to accomplish this. It is clear that to the extent that spent acid is made available for other uses, such as the acidulation of phosphate rock, there is a compensatory saving in virgin acid. Assuming that 75% of the original acid is recovered, there is a net disappearance of only 25% of the acid used. Compared with an outright loss of acid, such a recovery would permit the production of four times as much DDT," he explained.

The contrast between standards of living in the United States and in many other countries of the world was pointed out by Mr. Groggins. Most of advantages of American life are based on the abundance of foodstuffs, he said. Since the need in many countries is of social and political nature, he suggested that the American pesticide export program should be regarded as more than mere trade. "Consideration needs to be given to the opportunities for implementing government programs in building up good will and better living abroad," he declared. American farmers, after expenditures for land, seed, fertilizers and labor, are realizing more and more the advantages of protecting their investment through the use of pesticides. "Depending upon the need for food and the availability of funds, other countries will follow our progressive example in this field," Mr. Groggins declared.

(*Turn to page 89*)

Sidelights (Continued)

P. J. Reno, of the Hercules Powder delegation, was recipient of a special golf prize, unheralded on the program, presented for "outstanding performance". The gift, a pair of extremely well-padded falsies, was deemed appropriate because of "Toxaphene's" contribution to the dairy industry and since it would help Mr. Reno to put up a better front in promoting the product.

* * *

Members of the program committee were told by many that this years's meeting was among the best ever held by the association. Chairman George Krieger modestly brushed off such remarks by crediting other members of his committee with doing most of the work. Anyway, we strongly suspect that this was a teamwork proposition, and that the other half-dozen members all worked closely with George to come up with a good roster of speakers.

The committee, in addition to the chairman and Lea S. Hitchner, ex-officio member, included John A. Rodda, U.S. Industrial Chemicals, Inc., New York; Carlos Kampmeier, Rohm & Haas Co., Philadelphia; Alfred Weed, John Powell & Co., New York; M. R. Budd, Hercules Powder Co., Wilmington; and P. J. McManus, GLF Soil Building Service, Ithaca, N.Y.

No bugs Here" was the theme of an informal exhibit collected and mounted by one of your agents. It portrayed some of the foliage from Louis Bromfield's bugless paradise, "Malabar Farm", gathered during a recent inspection trip. Louis assured the visitors that when crops are adequately nourished they get so healthy that the bugs are "afeerd" to attack. Maybe so, Louis, but we got the evidence that something was after the leaves, and it looked suspiciously like bean beetle.

* * *

Winners in the annual golf tournament were as follows, according to John A. Rodda, U. S. Industrial Chemicals Inc., New York, chairman of the event.

Flight "A": J. A. Singmaster, Monsanto Chemical Co.; Paul Mayfield, Hercules Powder Co.; and I. W. Bales, Chipman Chemical Co.

Flight "B": E. H. Phillips, G. L. F. Soil Bldg. Service; Joseph H. Hanley, Co-op. Seed & Farm Supply Service; and Wm. M. Russell, Monsanto Chemical Co.

Flight "C": M. L. Somerville, Chipman Chemical Co. and A. G. Aitchison, Westvaco Chemical Div.

Kickers' Handicap Winners: Silas Besthoff, Faesy & Besthoff; W. F. Newton, Southern Alkali Corp.; J. F. Coey, Hooker Electrochemical Co.; B. M. Van-Cleve, Sherwin-Williams Co. and E. W. Genetive, Mathieson Chemical Corp.

The committee (in addition to chairman Rodda) was: J. I. Shafer, B. G. Pratt Co.; Jack Vernon, Niagara Chemical & Sprayer Div.; Charles Frost, Mathieson Chemical Co. and Thomas Morgan, AGRICULTURAL CHEMICALS.

Pasture Development Held as Key to Greater Volume in Sales for

FERTILIZER

—Photo by University of Kentucky Agri. Experiment Station

TREATING pastures as a *crop* instead of regarding them as pieces of land surrounded by fences, is one of the current ways to turn the present day of uncertainty, confusion and inflation into a future with promise. We have available all of the means necessary to do this; available acres, a continually expanding market for livestock products, and the "know-how" to produce good pastures. All that remains is to put science and common sense to work on the land; to develop an adequate and intelligent use of legumes and grasses as well as cultivated crops, so that every acre will produce its maximum.

Such a program does not mean the abandonment of all cultivated cash crops or seeding every acre to pasture or forage crops, of course. Rather, it means, that hay, silage and sod crops are important and profitable parts of the cropping system, and should be considered a crop just as much as other plantings.

That a tremendous potential for fertilizer sales lies in the national grassland farming movement is seen in the interest being generated in many areas by both state and federal agencies. The fertilizer trade has a considerable stake in how well the "Green Pasture" idea is put into practice, for this program offers a greater outlet for increased sales of fertilizer materials, than any other single use.

Dr. Taylor, the author, has presented some very convincing arguments to agricultural groups in different areas. This article is based on an address given at the recent Green Pasture Program in Spencer County, Ky. and at three regional meetings in the state.—Editor

by

Dr. John R. Taylor, Jr.

Chief Agronomist,
American Plant Food Council
Washington, D. C.

Fertilizer, the Key

SINCE grassland agriculture holds such a potential for profitable operation, it seems strange that there should be so many poor and unprofitable permanent pastures, hay fields and sod crops. Many things have contributed to this, but in my opinion, the major limiting factor on most soils, is a lack of available plant food. Perfect seeding with the best seed will fail unless the soil is well supplied with plant food. Pasture crops require adequate food for growth, of course, but too many are neglected and are allowed to starve to death. Fertilizer, when used in sufficient amounts, will rejuvenate soils and with it, usher in a new era of prosperity in grassland agriculture.

Some soils were well supplied with plant food when originally put into cultivation, while millions of acres were poor in the beginning. Some soils have been improved, while others have been allowed to deter-

iorate. In general, the more fertile soils on each farm have been planted to cultivated crops and the remaining acres put in pasture. In addition, row crops have received practically all the fertilizer with very little going to pastures.

The latest report of the U. S. Department of Agriculture shows that in 1947, only 12 per cent of the pasture acreage in Kentucky, Tennessee, West Virginia, Virginia and North Carolina was fertilized. Of the total amount of fertilizer used in these states, 90.4 per cent was applied to crops and only 9.6 per cent to pastures! This means only 320,300 tons of fertilizer on pastures out of a total of over 4 million tons used in this area. For the entire United States, only 4.9 per cent of the total fertilizer used was applied to pastures. To me this explains why we have so many poor pastures.

Pasture Crops Respond

PASTURE crops respond to heavy applications of fertilizer and it pays. When one studies the practices of successful grassland farmers, he finds most of them are applying adequate amounts of fertilizer to grow good crops of the right kind of plants. Ladino clover, alfalfa and orchard grass will not grow on land which has only enough plant food to support broom sedge. Also, numerous reports throughout the country show that a dollar invested in fertilizers for pastures returns 6 to 8 dollars.

Perhaps we have overlooked the fact that good pasture crops remove large amounts of plant food. Three tons of alfalfa hay remove about 135 pounds of nitrogen, 33 pounds of available phosphate, and 132 pounds of potash. This compares closely with the amount of plant food required to produce a 100-bushel-crop of corn. Three tons of bluegrass hay require about 80 pounds of nitrogen, 33 pounds P_2O_5 and 126 pounds of K_2O. Thus, a good grass-legume pasture mixture, such as orchard grass and ladino clover, requires heavy fertilization to be successful. How many pastures are fertilized at a rate which would produce 100 bushels of corn?

In starting new pastures the use of a complete fertilizer at time of planting is most desirable and is usually essential. A complete fertilizer will not only give the crops a good start, but helps to improve the stand.

Once the pasture is established, the fertilizer treatment will vary depending upon the crops and management. Phosphate and potash encourage the growth of legumes and nitrogen stimulates the grasses. The goal is to maintain the proper combination of grasses and legumes.

The better pasture and livestock program is making outstanding progress in Kentucky and other states, but the surface has been barely scratched. There are millions of acres of *so-called* pastures that can be renovated and made into *profitable* pastures. Also, millions of idle acres should be put to work to increase the farm income and protect the soil. Millions of dollars could be added annually to the income from agriculture if *all* the acres on farms were put to work producing income instead of being allowed to wash away through neglect.

Advantages of grassland farming are numerous, as mentioned before. Specifically, however, some of these items on the credit side should be enumerated. In the first place, it increases the net income of the agriculturist. It also produces the cheapest and best food for animals; increases acre yields of digestible nutrients and makes possible the production of higher grain yields at lower cost. Soil is protected against erosion and leaching and the practice offers a realistic and practical means of achieving permanency in agriculture. All of these factors add up to maintaining a higher standard of living in the United States.

In the past, too little attention has been given to pastures as a crop. Most of the time, the best land was set aside for corn, cotton, tobacco, small grain or other cultivated crops, and a fence strung around a few gullies, swamps, eroded hillsides or blackberry patches and called a "pasture." Furthermore, the only fertilizer received by these acres was the small amount washed out of the cultivated fields. It would require an animal with an extremely small appetite to keep himself alive on the diet afforded by such a setup. Yet, some will look at this picture and say that pastures won't pay.

But pastures treated as a regular crop have shown startling results. Combination of better cultured practices, better fertilization and better seed has produced remarkable increases in per acre yields of corn, cotton, tobacco, potatoes and other cash crops in recent years. But average yields of pastures and forage crops have lagged behind because they have not been treated as a crop.

This current trend toward better fertilization of pastures is bound to bring results to the extent that the 1950-60 decade will show the greatest pasture improvement in history. Research, demonstration and actual results are ample to show that profitable pastures can be grown in all areas. Gains of 300 to 600 pounds of beef per acre from improved pastures are not uncommon, and in Michigan, good pastures reduced the feed bill 25% for dairy cows. Renovation of hillside sod in Wisconsin tripled the carrying capacity, while in the deep south, good pastures are revolutionizing the one-crop system.

It should be emphasized again, that good pastures are cash crops. They can be grazed for production of milk and beef and they can be made into silage to save the cost of purchased feed. Also, they can be harvested as hay which finds a ready market and is about the only crop that can be grazed and then sold as a seed crop for cash!

Fertilization of pasture lands really pays off. The statement that every dollar invested in fertilizer for pastures, returns from 6 to 8 dollars, is no idle comment. It has been proved over and over again, and is finding more and more opportunities to benefit agriculture, year by year. ★★

Reviewing the first year of experience with new

WARFARIN RODENTICIDES

by

Ward Ross
Managing Director, Wisconsin Alumni Research Foundation

AFTER one year of commercial development and use, warfarin, the new anticoagulant rodenticide developed at the University of Wisconsin, is very probably today outselling all other rodenticides combined in dollar volume. In view of its spectacular commercial success, a brief review of the past and a look into future development possibilities might be timely right now, at the end of its first year of commercial sale. That the formulator and distributor of rodenticides, particularly in the agricultural markets, may have a more accurate picture of the product with which he is dealing, the following facts are set down:

(1) Enough warfarin products have been sold to produce several million pounds of warfarin finished bait. It is not, of course, known how much of this bait has actually been used since the amount of warfarin still on the shelves of the stores is unknown.

(2) This immediate public acceptance of warfarin has been based upon the spectacular performance of the product in the hands of the consumer - a performance which has even excelled the outstanding results achieved with the product during the experimental period when warfarin was tried by various government agencies, commercial exterminators and others skilled in rodent control (September, 1949 through June 1950).

(3) From the thousands of reports received warfarin has proved itself an outstanding effective rodenticide (a) in the hands of the unskilled user, as well as in the hands of experts; (b) against all common varieties of commensal rodents in the United States, including the Norway rat, the roof or black rat and the house mouse; (c) in all types of rodent infestations, including farm infestations in rural areas and household and industrial infestations in urban areas; and (d) in all parts of the United States, as well as many foreign countries, under all different climatic conditions.

(4) Since its introduction in late June, 1950 packaged consumer warfarin products have been introduced on the market by at least 181 individual manufacturers and formulators. These products have been broadly of two types, warfarin concentrates, usually containing 0.5% warfarin, designed to be mixed on the basis of one part of concentrate to nineteen parts of bait material by the user, and warfarin finished baits, ready to use, containing 0.025% warfarin. Of the 181 manufacturers and formulators which have introduced warfarin rodenticides on the United States market, fifty have marketed warfarin concentrates alone, one hundred and eight have marketed warfarin finished baits alone, and twenty-three have marketed both warfarin concentrates and warfarin finished baits.

Research Problems

PRIOR to its introduction on the market, a great deal of research had been done on warfarin. The basic research was done by Dr. Karl Paul Link and his associates in the Biochemistry Department, University of Wisconsin. Subsequently others participating in warfarin research included the laboratories of the Wisconsin Alumni Research Foundation, owner of the patents on warfarin; the laboratories of S. B. Penick & Company and Prentiss Drug & Chemical Co., Inc., the Foundation's licensees under its warfarin patents; the Fish and Wildlife Service of the U. S. Department of the Interior; the Communicable Disease Center of the U. S. Public Health Service; and the U. S. Department of Agriculture. As a result of this mass of research, a great deal was known about the compound before it was introduced on the market. However, due to developments in the use of the rodenticide, there are many research problems in connection with warfarin today which did not exist a year ago.

To illustrate, the appearance upon the market of a substantial number of warfarin finished baits has created additional problems concerning the keeping qualities and continued acceptability of such finished baits. Further research work remains to be done on problems such as the following:

(A) The perfecting of warfarin finished baits. This involves such problems as protection against insects, molding, rancidity, off-flavors and staleness; packaging; the use of dyes to reduce hazards; and the use of so-called attractants to increase acceptability.

(B) The use of warfarin in the control of field rodents as distinguished from rats and mice.

(C) Hazards of warfarin to other species, and particularly humans, pets and domestic animals and fowl. Sufficient work has been done in this field to establish that warfarin, when used according to directions, is a relatively safe rodenticide, its safety factor arising primarily from the fact that it is comparatively non-toxic in single doses and several small doses over several days' time are required to kill. However, on certain species, further work needs to be done to establish the dangerous level of warfarin to such species on a multiple or divided dose basis.

(D) Improvements of methods of analysis for warfarin, both with respect to product analysis and with respect to tissue analysis.

The Wisconsin Alumni Re-

search Foundation and its warfarin licensees are aware of these problems and recognize the need for their solution. Along these lines the Foundation has recently made a two-year grant for warfarin research to the Fish and Wildlife Service of the U. S. Department of the Interior and in addition, has considerably expanded and enlarged the program of warfarin research in its own laboratory at Madison, Wisconsin. Arrangements have been made to correlate this research program between the Foundation's laboratory at Madison and the Fish and Wildlife laboratories at Denver, Colorado and Gainesville, Florida. In addition, the Foundation hopes to arrange for certain phases of this research program to be carried on in the Animal Husbandry and Poultry Departments of the University of Wisconsin on a collaborative basis. It is hoped that the results of this research work, to be made available by the Foundation through its licensees to the manufacturers of packaged consumer warfarin products, will help with many of the unsolved problems relating to warfarin and will benefit the warfarin development as a whole.

Educational Work

THE Foundation, during this first year of warfarin commercial development, has been very active in aiding its warfarin licensees and their customers in the promotion of warfarin, particularly in the farm market. Shortly after warfarin was released for consumer sale, the Foundation initiated an educational campaign among county agents throughout the United States. This involved distribution of professional samples of warfarin to county agents for trial, and also distribution of literature giving information on warfarin. The agents were further informed on the placement of institutional advertising in publications directed primarily to extension workers. Over seventy per cent of the county agents in the United States requested samples of warfarin offered by the Foundation. Following this the Foundation made a survey of results achieved by these county agents in their use of warfarin. The findings of the survey, (to be published later) further prove and establish warfarin as the outstanding rodenticide now in use.

More recently, the Foundation has expanded its educational program with the offering of samples to home demonstration agents, extension directors and other extension workers and to Vocational Agricultural Teachers and Veteran Trainers throughout the United States. The Vo-Ag teachers program, initiated early in the summer of 1951, involves the distribution to these teachers of rodent control demonstration kits to aid in the instruction of students in the proper use of warfarin. These kits were offered to 9,700 Vo-Ag teachers, half of whom have been sent such kits in response to their requests. These demonstration kits include a recently published rodent control demonstration manual which outlines step by step the proper use of warfarin in effective rodent control.

Publicity

DURING its first market year warfarin received extensive publicity in a variety of media. An outstanding article on warfarin by Paul de Kruif appeared in the March, 1951 issue of *The Reader's Digest* (circulation all editions 15,000,000). In addition to this article, excellent warfarin articles or publicity items appeared in the following publication, whose circulation totals 10½ million.

American Home; The Pathfinder; New York Mirror; The Progressive Farmer; Newsweek; Poultry Tribune; American Poultry Journal; Breeder's Gazette; Agricultural Leaders Digest; and Better Farming Methods.

In addition to the above, articles on warfarin will appear this fall in the *Farm Journal, Capper's Farmer, The Turkey World, Northwestern Miller, Ranch & Farm World, Breeder's Gazette, Farmer - The Stockman*, and others.

Additionally, warfarin has received wide publicity in newspapers and on the radio throughout the United States.

In an endeavor to assist manufacturers of packaged warfarin rodenticides in the sale of their products, the Foundation in December, 1950, began making monthly mailings to such manufacturers of reprints of warfarin articles, government bulletins and other interesting publicity material regarding warfarin, most of which resulted, at least in part, from efforts of the Foundation.

Trends In Development

TWO interesting product developments began during the past year in connection with warfarin. One of these is the development of permanent bait stations for use with warfarin baits. Older type rodenticides available to the consumer were not suitable for use in permanent bait stations due primarily to the development of bait shyness on the part of the rodent to these outmoded rodenticides, making continuous use of the rodenticide in permanent bait stations unfeasible. A second point is the fact that most older type rodenticides needed to be used in relatively perishable baits — again not suitable for use on a continuous basis in permanent bait stations. Since warfarin produces no bait shyness in the rodent and is adaptable for use in semi-permanent cereal type baits, it is the first rodenticide to be adaptable for use in permanent bait stations where control may be maintained on a continuous basis by killing rats as fast as the premises are reinfested.

Safety Factors

PERMANENT bait stations for use with warfarin should be weather-proof; should protect the bait from children, pets and domestic animals; and should be designed in such a manner that they will hold sufficient quantities of warfarin bait and can be emptied and filled easily. Stations suitable for use in the home, farm and industrial establishments are available. Larger stations suitable for use with warfarin on city dumps are also available and have proven effective.

It is thought that the coming year will see introduced on the market additional types of permanent bait stations designed for use with warfarin baits. Notwithstanding that simple bait protective devices (which can be made from waste lumber) such as a board leaning against a wall, are effective in the use of warfarin baits, it is quite likely that a substantial market for various types of permanent bait stations for use with warfarin will be developed in the next few years.

A second interesting trend in the warfarin development is the introduction on the market of packages of finished warfarin bait which packages themselves constitute either bait containers or protective bait stations. Several of this type of combination package and bait container or protective bait station, are now on the market and it is anticipated that the future will bring further new and improved designs of such devices. Advantages of simplicity of use are important, as are avoidance of the consumer handling the poisoned bait (a psychological advantage notwithstanding that there is little or no hazard in connection with such handling) and in the case of those packages which constitute protective bait stations, automatically forcing the user to protect the bait from children, pets and domestic animals.

Rat Elimination Saves

THAT rats and mice cause very heavy economic damage in the United States and elsewhere, is well known. Various figures are frequently used, such as the figure that a rat costs $2.00 a year to feed and that he destroys ten times as much feed as he eats. However, the Foundation believes that there is a paucity of actual damage figures. Consequently, it is now working on a plan to demonstrate the actual cost of rats to a poultry farmer — the cost being measured in feed consumption with a given number of poultry with the premises infested with rats as compared to such feed consumption with the rats cleaned out. This program will involve collaborative studies with poultry farmers located in different geographical areas of the country. The program may be later broadened in scope to encompass other types of farms.

Public Health Aspect

ANOTHER development of interest in connection with warfarin is its use in ridding entire communities of rat and mouse populations. Warfarin, if properly used, is a tool which can be employed effectively to clear an entire community of rats and mice and then control reinvasion and maintain the rat and mouse population at a bare minimum for an indefinite time. Community programs with warfarin have been carried on successfully in such communities as Middleton, Wisconsin; Algona, Iowa; and Buchanan, Michigan. As experience is gained in this field, it is anticipated that more and more communities will undertake to clean out their rat infestations and keep the communities relatively free from the rat menace.

Advertising Claims

IT can be said fairly that the combined advertising effort at the consumer level of those concerns marketing packaged warfarin consumer products has, during the last year, exceeded all previous consumer advertising efforts put behind any rat poison in any one year. These advertising programs include not only extensive magazine and newspaper advertising but also radio advertising of broad scope.

At first, exaggerated and unwise advertising claims were made for certain warfarin products. The Foundation of course, has never been in sympathy with the use of false or unwarranted advertising claims on warfarin products. It feels that warfarin is such an outstanding product that it can be sold successfully with no exaggeration in the claims made for it. However, while the Foundation controls by contract the advertising claims made by its two warfarin licensees, it has no control or police power over the advertising claims made by customers of those licensees. Even so, the Foundation has endeavored to minimize the extent of exaggerated warfarin advertising, thus aiding efforts of government agencies along the same lines. It believes that today there is considerably less unwarranted warfarin advertising than in the early days of the program and that the situation in time will rectify itself.

Foreign Development

ON new products such as warfarin, there is usually a lag of six months to a year in the development of foreign markets. Such has been the case with warfarin. Within the past six months, however, substantial foreign interest in warfarin has developed and inquiries have been received by the Foundation and its licensees from all over the world. The Foundation licensees have recently just begun to export warfarin products on a volume basis and it is hoped that this foreign development will continue at an increased rate. Great impetus was given foreign interest in warfarin when the article in *Readers Digest* was printed in eighteen foreign editions.

The potential world market is well illustrated by the recently expressed opinion of a German scientist that rodents destroy sufficient food over the world to feed one hundred and fifty million people — roughly the entire population of the United States.

Future Development

IN view of its performance under a wide variety of conditions, warfarin has found its place in combatting the rodent menace. With the large volume of warfarin products being used already by the American people, the effect of the use of this rodenticide in reducing the rodent population of the country as a whole, will be interesting to watch. It will be in this area that rodent control specialists in government agencies can estimate how much the rodent population has been reduced, with the accompanying saving of millions of dollars to the American people.★★

A prominent entomologist of the U.S.D.A. Bureau of Entomology and Plant Quarantine tells National Agricultural Chemicals Association members inside information on

Problems Facing the INSECTICIDE INDUSTRY

ONE of the most important problems confronting the agricultural chemical industry today is determining the use limitation of various pesticidal chemicals developed during the past few years. Not only is it necessary to determine the effectiveness of a chemical against numerous pests, its compatibility with other pesticides, and the development of suitable formulations, but it is also necessary to know whether or not the chemical will injure plants, contaminate the soil and whether toxicity of the chemical to man and animals, including wildlife, presents a hazard in its use under prescribed conditions.

There is a present tendency by some to confuse toxicity with hazard. These two terms are not synonymous. *Toxicity* is the capacity of a substance to produce injury; *hazard* is the probability that injury will result from the use of the substance in the quantity and in the manner recommended. The inherent toxicity of a pesticidal chemical to warm-blooded animals may have little or no direct bearing on the final food hazard. Many of the toxic materials are applied at a time when the edible portion of the plant has not yet developed.

Operational hazards are also extremely important, and although these are deplorable of course, it should be remembered that farm accidents involving the use of pesticides are insignificant when compared to farm accidents involving the use of mechanical tools. Statements that those responsible for the development of pesticidal products have not yet recognized adequately the need of safeguarding the health of the workers in the agricultural chemical manufacturing plants, the users of the pesticides and the consumers of the food products are not warranted. Extensive data on the toxicology and limitations of use of these chemicals were presented by both government and industry at the recent Food and Drug Hearing on "Tolerances for Poisonous or Deleterious Residues on or in Fresh Fruits and Fresh Vegetables" and numerous statements have been issued regarding the precautions to be taken in the handling and use of pesticides, also by both government and industry.

Reports Forthcoming

THERE is now in the process of being assembled in the Department of Agriculture, a comprehensive report on the studies that have been carried out during the past several years in the field of toxicology of the newer insecticides, fungicides and herbicides. The report will include the results obtained by the combined efforts of federal and state agencies in cooperation with commercial organizations on the effect of pesticidal chemicals on laboratory animals, livestock, fish and wildlife, beneficial insects and plants. The contamination of agricultural products with chemical residues is also considered in the report.

Another report is being prepared in the Department of Agriculture on studies to determine the palatability of peanut butter made from peanuts grown in soil following cotton which had been treated with insecticides containing BHC. These two reports will cover some rather comprehensive studies but they are only a small part of the extensive studies that have been conducted and are being carried out by both government and industry to determine the limitation of use of pesticidal chemicals.

Analytical Methods

IN connection with entomological and toxicological studies, it is highly desirable to have accurate and specific methods of analysis for each pesticide. Most of the newer products are relatively complex synthetic organic compounds. They differ from the inorganic insecticides, such as the arsenicals and fluorine products, in that their effectiveness is dependent upon the composition or structure of the molecules as a whole rather than upon a specific element such as arsenic, lead or fluorine.

In general, the newer agricul-

by

Dr. H. L. Haller*

Assistant Chief, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, Washington 25, D. C.

tural insecticides may be divided into two broad classes, the so-called chlorinated hydrocarbons and the organophosphorus insecticides. It is not sufficient to determine the organically-bound chlorine or the phosphorus content of these products and calculate back to the original chemical. Inert contaminants and degradation products containing these elements would interfere and lead to erroneous results. Although a number of highly satisfactory analytical methods have been developed, much more work remains to be done. There are still in use several of the effective chlorinated hydrocarbons for which no specific chemical analytical method has been developed.

The cooperative studies carried out by government-industry groups on methods for benzene hexachloride, tetraethyl pyrophosphate and allethrin have been profitable. These studies concerned themselves with the insecticidal chemical itself. We now need for these, and many of the other newer insecticidal chemicals, methods that will permit their detection and accurate estimation in various formulations —dust, wettable powders, emulsifiable concentrates and aerosols. Methods are also needed for determining the products in combination with other insecticides and fungicides and in spray residues. Although such problems are much more difficult, they are extremely important both from the standpoint of the user and the manufacturer. In the case of formulation, consideration must be given to the presence of other related chemicals, solvents and adjuvants. All of them may have a bearing on the final values reported. In the case of residue determinations, the insecticidal chemical is usually present in relatively small amounts in combination with relatively large amounts of plant or animal materials, and accurate procedures are needed for their quantitative separation. That both industry and government recognize their responsibility and the importance of these problems was in part demonstrated by the symposium on Methods of Analysis for Micro Quantities of Pesticides held in conjunction with the spring meeting of the American Chemical Society at Boston, last April. Thirty papers collaborated in by more than fifty chemists and covering methods for a wide range of pesticidal chemicals were presented at the symposium.

Another activity of interest is the Interdepartmental Committee on Pest Control. This committee consists of representatives of the Departments of Defense, Federal Security, Interior and Agriculture. It seeks to coordinate the work and exchange of information among government agencies and to promote a bettter understanding of pest control in both industry and government. From its beginning and until his death, Dr. S. A. Rohwer was chairman of this committee and was its most active worker.

In addition to Dr. Rohwer, the committee also lost Dr. Ward B. White of the Food and Drug Administration who died last spring. Dr. White was also actively interested in the work of this committee. He was succeeded by Dr. A. J. Lehman of the Food and Drug Administration and the writer was appointed by the Secretary of Agriculture to represent the Bureau of Entomology and Plant Quarantine. At a meeting held on May 18, 1951 the committee elected Dr. S. W. Simmons, Public Health Service, Savannah, Georgia, as secretary to succeed Dr. Paul Neal who relinquished this office because of ill health. The writer was elected chairman of the committee, which plans to meet every three months. The group desires to cooperate with all concerned with the various aspects of the development of pesticides and welcomes any suggestions that may aid in furthering mutual problems.

Nomenclature Problems

ONE of the problems with which the committee has concerned itself has been the development of suitable coined names for synthetic organic pesticidal chemicals having complex systematic chemical names. Fifteen names have been developed, most of which have found world-wide acceptance. Most of the names adopted were developed by the committee working in close cooperation with the company whose chemical was involved. A definition was agreed upon and the name was preempted by the chairman of the committee in the Patent Office to prevent its use as a Trade-Mark. Some of you know the many difficulties involved in selecting names that are satisfactory to a large group having different interests.

At the meeting held on last

* From paper delivered before National Agricultural Chemicals Association, Spring Lake, N. J. September 7, 1951.

May 18 the committee decided to initiate a new procedure in regard to coined names for pesticidal chemicals. In the future, the sponsoring organization will be requested to submit one or more names for a new pesticidal chemical that has reached the stage of commercial development. The name shall apply to the pure chemical and a suitable definition shall be developed for the technical or commercial grade. As in the past, a name for a mixture of two or more chemicals will not be considered. The sponsoring company will also be required to submit data on the value of product for the purposes for which it is intended, together with pharmacological and other relevant data.

The committee believes it is desirable for the producer of the chemical to trade-mark the name and then release it for use as a coined name. Such a procedure, it is believed, will reduce the chances of having a coined name developed in this country registered as a Trade-Mark in a foreign country. The foregoing procedure is a tentative one, and the Interdepartmental committee will welcome any suggestions offered on this subject.

In connection with coined names, here is a problem that although minor, is in need of consideration. In recommending an insecticidal chemical by governmental agencies, it is usually customary to mention the chemical by its scientific name, or by a coined name, rather than to give Trade-Mark names of preparations containing the chemical.

In some cases, the trade-mark name gives no indication of the chemicals which comprise the product. To be sure the label states, usually in fine print, the composition of the product, but the average retailer does not have time to familiarize himself with the composition of every product on his shelves. It has been our experience in recommending a specific insecticidal chemical and furnishing the names of dealers where preparations containing the chemical might be obtained, that the prospective consumer has returned and informed us that he was unable to obtain the chemical which had been recommended to him.

A brief word on some organizational changes in our Bureau may also be in order. Since the first of July the Bureau has been conducting its control and regulatory operations and its field business activities through five regional offices.

The purpose of this reorganization is to provide the best possible utilization of the Bureau's manpower and equipment resources and to permit a unification and standardization of many of the policies and administrative procedures governing program operations.

The five regional offices are located at Greenfield, Massachusetts; Gulfport, Mississippi; San Antonio, Texas; Berkeley, California; and Minneapolis, Minnesota. Information as to the states that the regional offices are servicing may be obtained from the Bureau. Each of the regional offices is under the direction of a Regional Director, who reports to the Chief of the Bureau.

No change is being made in the program direction of the Bureau's research activities, although the field business functions of these programs are now handled through the five regional offices. The research work will continue to be directed by Division Leaders in Washington. Any studies relating to research programs that some of you may be conducting cooperatively with the Bureau will not be affected by these changes.

Up to date information regarding the occurrence, distribution, and abundance of insect pests is of importance to American agriculture as a basis for the proper application of control measures to insure continued high production of food, fiber, and other essential crops. This is true in normal times, but even more important in periods of national emergency.

The most accurate methods of determining presence of new insects or abundance of old ones is through surveys, many of which are conducted each year in the United States. Some are made independently by states, some by the federal government and some by other agencies. It is impossible for any one agency alone to collect and disseminate adequate current information on the status of all economic insect pests. Recognizing this, the Bureau of Entomology and Plant Quarantine recently contacted the agricultural officials of each state relative to a plan for strengthening cooperative insect surveys in the United States, not only from the view point of an emergency measure but as a permanent service to agriculture. It was suggested that a clearing house be established in each state for channeling the information to the Bureau's Division of Insect-Survey and Information in Washington, so that comprehensive current reports on economic insects could be prepared and released at frequent intervals on a nation-wide basis.

The response to this proposal was gratifying. The majority of replies indicated that the agricultural workers of the country realize the need for and desire for a more current and complete cooperative economic insect reporting system. Twenty-eight states have already named an individual or office to act as a clearing house for insect information. Other states have stated their willingness to cooperate. In view of the spontaneous increase in the number of reports being received, a cooperative report will be released for the remainder of the 1951 season every two-weeks rather than on the monthly schedule previously followed. The first issue of the new *Cooperative Economic Insect Report*, assembled in the Division of Insect Survey and Information, was released July 31, 1951. To make the report serve its most useful purpose, it will be issued weekly beginning in 1952.

It is hoped that the entomologists in industry, as well as state and federal workers, will make available their current observations on economic insect conditions for inclusion in this cooperative undertaking.

More Nitrogen— More Solid Fertilizer . . .

by
W. A. Minor
Assistant to the Secretary of Agriculture
Washington, D. C.

W. A. MINOR

THE importance of an adequate supply of nitrogen fertilizer is indicated by the part it can play in obtaining the necessary production of food and fiber to meet mobilization needs and the needs of a continually increasing population. We must look forward to and plan for sustained high level production of food and fiber and the maintenance and improvement of our soil resources. The increased food and fiber must come in large part from the land which is now in crops and pasture. Manpower, fuel, and equipment can also make larger contributions to production when used in association with adequate amounts of fertilizer.

The total supply of nitrogen for fertilizer has increased in the last five years from 701,000 tons N per year in 1945-46 to 1,285,000 tons N for 1950-51, an increase of 83%. The consumption of nitrogen fertilizer has doubled within the last seven years and is likely to double again by 1960.

The construction of 700,000 tons additional capacity for nitrogen for fertilizer is needed as quickly as it can be built. This need is exclusive of any increased nitrogen needed for other purposes. In connection with the planning and construction of these new facilities, consideration needs to be given to the kinds and forms of nitrogen fertilizer which are needed. In this consideration it is apparent that we need increased production of readily storable solid nitrogen materials.

The Department of Agriculture believes that at least 130,000 tons of the 700,000 ton expansion should be in the form of urea compounds. The urea compounds are the most concentrated form of solid nitrogen fertilizer presently available for direct application. This concentration results in lower transportation and hauling costs. Also, urea has other desirable characteristics which recommend it, including its value as a feed supplement for ruminants.

It is also suggested that 150,000 tons N of the new capacity be utilized for the production of nitrophosphates as a means of substantially easing the shortages of sulfur. There are several processes for acidulating phosphate rock with nitric acid to produce readily usable nitrogen-phosphate fertilizers. Similarly, we believe that the production of ammonium phosphates should be stepped up by at least 40,000 tons N. This provides a readily usable nitrogen-phosphate material of high analysis. The remainder of the 700,000 ton N addition could well be in ammonium nitrate, ammonium sulphate, and in ammonia and nitrogen solutions.

(Turn to page 97)

STEEL FOR FERTILIZER

A total of 6,200 tons of steel earmarked for construction of five new nitrogen plants was expected to be allocated at any time, as this issue went to press. George Meyers, assistant chief of the Industry Expansion Division of the National Production Authority, Washington, was to put through the order late in September, which would make possible the construction of facilities to manufacture 250,000 annual tons of nitrogen, by the end of 1952.

According to William R. Allstetter, deputy director, Office of Materials and Facilities, Production and Marketing Administration, U.S.D.A., Washington, the 6,200 tons of steel were to be allocated for the fourth quarter of 1951, and were to be made available by NPA to plants designated by the U. S. D. A.

The program was arranged under a "4-C Application," involving the proper authority to begin construction, the allotment of controlled materials to manufacturers, and ratings for fabricated metal products such as equipment.

Companies involved in the allocation are: Commercial Solvents Corporation, Sterlington, La.; Allied Chemical & Dye Corp., with plants at Hopewell, Va. and Southpoint, Ohio; Spencer Chemical Co., Vicksburg, Mississippi; Shell Chemical Co., Dominguez, Calif. and Mathieson Chemical Co., Lake Charles, La.

Ohio, Pennsylvania Covered; Experiment Stations Visited on

NFA FERTILIZER TOUR

SEVERAL hundred miles were covered by the Plant Food Research Committee of the National Fertilizer Association on its tour through Ohio and Pennsylvania, August 23-26. The group met at Columbus, Ohio and spent the first day inspecting Ohio State extension demonstration tests near Columbus, and the Ohio Seed Corn Producers Research Farm, Croton, Ohio. The group then moved on to Mansfield, where the tour members stayed over night, and took off next morning in a 14-car caravan to visit the farm of Louis Bromfield, near Lucas. Here the men met the author, who in an informal talk, described the work at Malabar farm, recalling the rehabilitation job which has been carried on for the past several years. The author, with his prized boxers riding with him in a station wagon, led the visitors to different spots on the several hundred acre farm; taking them first to a high hill, formerly known as "poverty nob" from which practically the entire layout could be seen. This hill a few years ago, said Mr. Bromfield, would not support more than three cows for any length of time, but now feeds many times that number. He lauded the use of fertilizer, stating that he is becoming "more and more convinced of the value of fertilizer," and declared that a farmer can get a $3 return for every dollar spent for fertilizer, providing other good farming practices accompany this investment. "Fertilizer costs less the more you put on," he declared, and proved his point by showing members of the tour many spots where heavy application of chemical fertilizers had more than paid off.

Emphasizing the value of grassland farming and the raising of livestock, he said that "the sheer force of economics is making farming more and more valuable," and by the same token, the value of grasslands is increasing. He said that a few years ago, Malabar farm couldn't carry 30 head of cattle whereas now it is feeding upwards of 350. His plan, he said, is to apply commercial fertilizer to grow bigger plants which in turn are fed to livestock which benefit from the added nutrition.

Grass farming is a gold mine compared to ordinary farming, the author confided to his visitors, and added, that the secret of success lies in high production at the lowest possible cost.

Referring to the number of visitors who come each year, he said that neither his house nor barns are meant to be show places. "Instead, our show is our crops," he declared.

"Bugs Not Necessary"

IT was with great pride that Mr. Bromfield showed his visitors the garden plots, which, he said, had been made resistant to insect and plant disease damage through proper fertilization. He took the visitors through his cabbage and cauliflower plots, and a bean patch which had received no insecticide applications at all. The audience listened with great patience as he expounded the theory of a bugless world freed of the necessity of spraying and dusting to control pests. Mr. Bromfield explained that after farming in Europe for a number of years, he was greatly chagrined at returning to the U. S. and finding the farm and trade journals full of advertising for insecticides; and he had thereupon decided to find the means of preventing such encroachments of insects and fungi by growing plants which would be too healthy for such attacks. This, he said, is what he is working for at Malabar. (Some more practical-minded visitors took a look at the leaves of "bugless" bean and cauliflower plants, to find the leaves of many of them almost completely eaten away)

Upon leaving Malabar farm, the committee and its guests motored on to Wooster, Ohio, where the Ohio Agricultural Experiment Station was visited. Here, experimental corn fields were inspected, and in the evening, an informal lecture was presented by Dr. J. D. Sayre, describing his experiments with radioactive fertilizer materials to determine the source of nutrients in the plant.

Journeying through the industrial and agricultural area of northeastern Ohio, the caravan, with each auto displaying a small green plastic "flag" for identification, headed for Slippery Rock, Pa., where lunch was provided at the State Teachers College. The group then visited demonstration tests under the direction of the departments of vocational agriculture and agronomy.

This event of Saturday, completed the tour, with most of the travelers driving on to State College, Pa., where the annual meeting of the American Society of Agronomy was to start on Monday. The committee in charge of the tour was H. H. Tucker, Coke Oven Ammonia Research Bureau, Columbus, Ohio; Proctor W. Gull, Spencer Chemical Co., Kansas City, Mo. and G. N. Hoffer.

Agronomy Meeting

AN all-day session on Fertilizer Technology was included on the program of the joint meeting of the Soil Science Society of America and the American Society of Agronomy, at Pennsylvania State College, State College, Pa. The fer-

Photos, this page

Informal shots taken on NFA Plant Food Research Committee tour, August, 22-25. Top photo: Louis Bromfield, author, describes to group the story of "Malabar Farm" atop a high hill at center of farm.

Second photo: Part of group at Bromfield farm: (L to R) Procter Gull, Spencer Chemical Co., Kansas City; Dean Keller, Barrett Division; J. Fielding Reed, Potash Institute of America; Dale Friday and B. S. Chronister, Barrett Division; N. D. Morgan, Potash Institute of America; and Murry McJunkin, Coke Oven Ammonia Research Bureau, State College, Pa.

Third photo: Part of group at Ohio Agricultural Experiment Station, Wooster.

Fourth photo: Dallas Cantwell, Southern agronomist for Spencer Chemical Co., Atlanta, Ga.; Claire Pineo, graduate student at Cornell University, Ithaca, N. Y.; J. E. Adams, director of the agronomy department, Texas A & M College, College Station, Texas; and Albert S. Hunter, Soils Department, Oregon State College, Corvallis.

Lower photo: Robert Engle, (L) and Malcolm R. McVickar, (R) both of National Fertilizer Association, Washington, D. C., confer with Dr. J. D. Sayre at Wooster, Ohio, about radioactive experiments in corn.

tilizer session occupied the first day of the week-long meeting which continued from August 27 to Aug. 31.

K. D. Jacob, head of the Division of Fertilizer and Lime, Bureau of Plant Industry, Soils and Agricultural Engineering, U.S.D.A., presided at the morning session of the first day's program which featured an illustrated talk on "Developments in World Fertilizer Production" by G. J. Callister, Food and Agriculture Organization of the United Nations.

Mr. Callister stated that the purpose of his talk was to appraise the fertilizer production of the world, particularly that of "backward" nations. His thesis was built around four main premises:

1. That the peoples of the world have made up their minds that they must be better fed. They are becoming calorie conscious.

2. In order to accomplish this end of feeding populations more adequately, land must be made to yield more crops which in turn must also be protected from destructive insects and disease.

3. The changes and developments in agricultural science during the past twelve years have been greater than that of all history before. However, this is just the beginning, he declared.

4. The world is watching with interest, scientific developments made in North America, and papers presented at meetings such as the one at which he was appearing, will be followed in many places, Mr. Callister asserted.

Following his introductory remarks, he showed colored slides of fertilizer production in various parts of the world, revealing an awakening in many countries where modern fertilizer manufacturing plants have been installed of recent years.

Following Mr. Callister, was E. D. Crittenden, Nitrogen Section, Solvay Processing Division of Allied Chemical & Dye Corp., who discussed the use of Nitric Acid in the fertilizer industry. He showed slides illustrating how nitric acid might be

(*Turn to page* 88)

Photos (1st row, below):

(L to R): Drs. Ritchie Taylor and Vincent Sauchelli, both of Davison Chemical Corp., Baltimore, Md., Drs. Russell Coleman and H. B. Mann, president of the National Fertilizer Association and Potash Institute of America, respectively, Washington, D. C.; Dr. W. H. Pierre, head of the Agronomy Department, Iowa State College, Ames; Dr. Emil Truog, University of Wisconsin and Dr. H. W. Myers, Kansas State College, Manhattan. E. G. Jacob, division of Lime and Fertilizer, Bur. of Plant Industry, Soils and Agricultural Engineering, U.S.D.A., Beltsville, Md., G. J. Callister Fertilizer Consultant, Food and Agriculture Organization, United Nations, Rome, Italy, and G. W. Josephson, U. S. Dept. of Interior, Bureau of Mines, all speakers on Agronomy program.

Second row (below):

(L to R): Borden Chronister, Barrett Div., Allied Chemical & Dye Corp., Hopewell, Va.; Mrs. R. P. Moore and Mr. Moore, Director, North Carolina Crop Improvement Association, Raleigh, N. C.; John R. Taylor, Jr., Chief Agronomist, American Plant Food Council, W. F. Watkins, U.S.D.A., Washington and C. L. W. Swanson, Connecticut Agricultural Experiment Station, New Haven. New president and immediate past-president of the American Society of Agronomy, H. P. Cooper, Clemson, S. C., and L. F. Graber, University of Wisconsin, Madison, respectively.

(Left) Paul T. Truitt, president, American Plant Food Council and S. F. Thornton, F. S. Royster Guano Co., Norfolk.

Research basis for continued advancement in development of

Agricultural Chemicals

by

P. H. Groggins*

Chief, Agricultural Chemicals Section,
Chemical Division

National Production Authority
U. S. Department of Commerce
Washington, D. C.

CHARACTERISTIC of the agricultural chemicals industry and fundamental to its progress during the past ten years, is the great emphasis being placed on research. Only a few years ago the industry consisted chiefly of three groups; processors and sellers of pyrethrum and rotenone, manufacturers of arsenicals, and producers of copper sulphate, nicotine and mercurials. However, today's emphasis is on the development of new insecticides and fungicides. This support of continuous systematic research on pesticides, relatively new, is a healthy change from the almost complete reliance on naturally-occurring organics such as pyrethrum, rotenone and mineral poisons. While research is good for the industry as a whole, it also means that many new products may have only a brief commercial history.

It is inevitable that research must beget more research in our competitive economy. This trend, deeply inbedded in our chemical industry, has accounted for the almost endless succession of new creations to enrich our living. From industry's laboratories will come better pesticides which will be either more specific or more effective in action. Many will be safer with respect to hazards of application and toxic effects on man and animals. The net result of this organized experimentation on a large scale is certain to result in developments beneficial to agriculture, enriching our domestic economy, and aiding in the control of objectionable bugs to improve our living environment.

An important corollary of the chemical and entomological research on the development of new pesticides is the emergence of a sense of responsibility with respect to the introduction and marketing of the products. The National Agricultural Chemicals Association has affirmed that it is not enough merely to discover a new pesticide and painstakingly test its efficacy against numerous insects or fungi under all conditions and over a period of several seasons. The industry recognizes that in many instances, major responsibilities commence only after this work is done. These responsibilities are the exacting and time-consuming investigations to determine the hazards to man or beast that might arise from the handling or application of these new chemicals or from eating foods or feeds containing spray residues.

It is not my desire or purpose to enter disputes about the virtues or hazards of pesticides or the regulatory measures governing their sale. That is an Association problem and your attitude is a matter of record in the sworn testimony of your representatives before federal tribunals. Viewed objectively, it appears that a reasonable approach to the problem is to compare the demonstrable benefits stemming from the use of pesticides with conditions prior to their introduction; to weigh the incontrovertible evidence of better health and more abundant living

* From talk presented at 18th Annual Meeting, National Agricultural Chemicals Association, Spring Lake N. J., September 7, 1951.

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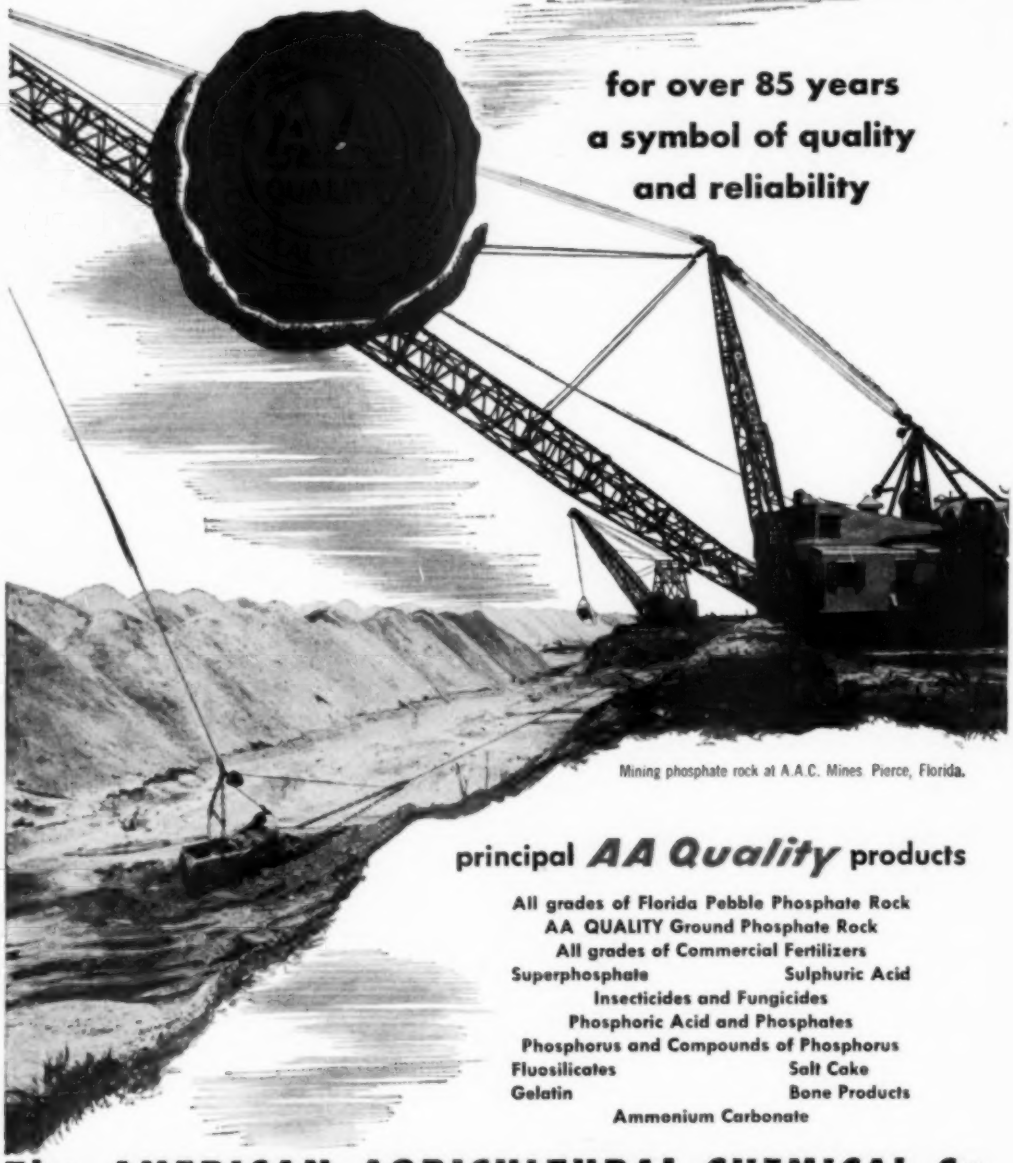

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against speculation and insinuation regarding possible ill effects. In these days of progress and change, it appears reasonable to hope that regulatory agencies will provide the necessary stimulus and cooperation to permit progress while exercising necessary precautions to safeguard public health.

It is curious to note that different yardsticks, civilian and military, may be used to measure the good or evil of pesticides. History records that our military used DDT freely on our troops and sometimes on whole populations abroad. They used it also to free potential battle areas of mosquitoes and other insects to protect our combat forces. Obviously, this was done because the demonstrable good greatly outweighed any potential hazard. Militarily, this might be called a "calculated risk." One wonders if any progress since the beginning of creation has not involved a risk.

Conservation Lauded

SINCE joining the National Production Authority, I have been impressed with another beneficial influence of the chemical industry on the pesticide industry — that of conserving scarce materials and improving the efficiency of operations. Because of the shortage of sulfur and sulfuric acid, it became apparent to producers of DDT that every effort would have to be made to recover their spent acid. According to advices from industry, practically every interested firm has already taken such action or is now taking steps to accomplish this. It is clear that to the extent that spent acid is made available for other uses, such as the acidulation of phosphate rock, there is a compensatory saving in virgin acid. Assuming that 75 percent of the original acid is recovered, there is a net disappearance of only 25 percent of the acid used. Compared with an outright loss of acid, such a recovery would permit the production of four times as much DDT. For this accomplishment, the DDT producers deserve much praise and I want to take this opportunity to commend them for their timely and constructive action.

A more spectacular example of conservation relates to the production of lindane from technical benzene hexachloride with the advantageous utilization of the relatively inert isomers. By using the alpha and beta isomers as raw material for the production of hydrochloric acid and trichlorobenzene and by converting the latter to tetrachlorobenzene and 2,4,5-T, there is an appreciable saving in our national reserves of benzene and chlorine. In fact, the pesticide industry can save from 50 to 86 percent of these scarce materials and use them for the purposes for which benzene and chlorine must otherwise be provided. From statements in NPA files, there is every indication that many of the producers of technical BHC are adopting the more efficient procedure of producing lindane or at least a high gamma insecticide. This is welcome news to the Department of Agriculture because of the concern regarding the ill effects of the large quantity of inert benzene hexachloride on the soil and on certain crops. Once more I commend your industry for taking the steps to improve product and, at the same time, to conserve strategic materials.

Finally and briefly, I want to discuss the importance of your cooperation in organized federal pesticide export programs. You will recall that at our recent DDT Industry Advisory meeting, arrangements were made for an implemented 1951-52 program calling for the production of 105 million pounds of which a minimum of 15 million pounds was to be exported under supervision of the Office of International Trade and Economic Cooperation Administration. The DDT producers in their response to Manly Fleischmann's letter have given evidence of splendid cooperation by offering to supply at least the minimum quantity of DDT pursuant to the provisions of N-32. The NPA is fulfilling its responsibilities in implementing the program by aiding some of the producers in getting needed materials and equipment. The OIT and ECA have already taken steps to fulfill their international obligations in a systematic manner. All of these efforts, we hope, will result in a satisfactory program and freedom from directives and special appeals. With the continued help of the Association we can look forward to a successful year of planned production. I want to emphasize my personal appreciation of your cooperation, and it would not be surprising if interested governmental agencies would also inform your Association of their appreciation.

Export Program

THE Offices of International Trade and Economic Cooperation Administration have recently given me a detailed statement showing how they intend to distribute the DDT subject to DO ratings. This statement calls for the export of 20 million instead of 15 million pounds of DDT, but we won't worry about that now. What is interesting and important is the fact that most of the minor nations of the globe are to receive American-made material. It is obvious, therefore, that the OIT and other federal agencies may be laying the groundwork for an enormous, pest-emergency trade. An important factor which would contribute to the continuation and expansion of this trade would be the knowledge in foreign countries that they could depend on the scheduled delivery of specified amounts of DDT and other pesticides. The importing nations want the same assurance that domestic agriculture and health organizations now have in planning farm and sanitation pograms. Is this unreasonable?

If the export program merely provided an opportunity for trade expansion and more profits, I would not have brought up the subject, by the same token, I would not have taken the trouble to send to members of the DDT Industry Com-

(*Turn to Page 101*)

Formulating for '52 ?

. . . Here's something to consider

DURING the 1950-51 season, *120 million pounds* of agricultural concentrates were made with ATLOX* emulsifiers—proof of the effectiveness of Atlas Research in developing emulsifiers for insecticide and herbicide concentrates.

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American Chemical Society papers cover wide scope of

Pesticide & Fertilizer Field

MORE-THAN-USUAL attention was given to symposia and papers on agricultural chemicals at the September meeting of the American Chemical Society in New York and Washington, judging from the numbers in attendance at sessions on the subject.

The Division of Fertilizer Chemistry elected as chairman, Dr. S. F. Thornton, F. S. Royster Guano Co., Norfolk, Va. to succeed Dr. Vincent Sauchelli, Davison Chemical Corp., Baltimore, who becomes a counsellor for the Division. Under new rules of the Division, a new office of vice-chairman was established. Elected to this position was A. L. Mehring, U. S. Department of Agriculture, Beltsville, Md. Jesse Romaine, Potash Institute of America, was named secretary-treasurer to succeed Dr. Thornton.

Among papers presented at the ACS Fertilizer Division were many dealing with technical phases of manufacturing, including the production of superphosphate by use of nitric acid instead of sulfuric acid. Speakers represented many manufacturing firms as well as the Tennessee Valley Authority, state Experiment Stations and the U. S. Department of Agriculture.

Summaries of some of the papers are as follows: (Several summaries were presented in last month's Agricultural Chemicals; the ones herewith are additional)

PHOSPHORIC ACID FROM LOW-GRADE PHOSPHATES BY THE SULFURIC ACID PROCESS. L. D. Yates and J. G. Getsinger, Tennessee Valley Authority, Wilson Dam, Ala.

Small scale studies were made of the use of low-grade phosphates in the manufacture of fertilizer-grade phosphoric acid by the sulfuric acid process. The purpose of the work, which was largely exploratory, was to point the direction that further and large scale tests should take to develop uses for low-grade phosphates in the manufacture of fertilizers.

Most of the work was with high-silica Tennessee matrices (20 to 2-% P_2O_5, 7% R_2O_3). Tests also were made with washed Tennessee phosphate sand (23% P_2O_5, 4% R_2O_3) and with calcined and uncalcined Idaho phosphate (27 and 23% P_2O_5, 4.5 and 5.8% R_2O_3); high grade Florida phosphate (35% P_2O_5, 2.6% R_2O_3) was used for comparison. Extraction of phosphate was carried out continuously using one or two extraction tanks, and the temperature of extraction usually was 200°F. Byproduct calcium sulfate was filtered from the acid produced at rates of 50 gallons/(hour)(sq ft. filter area) when using Tennessee matrices and washed sands, 40 when using calcined Idaho phosphate, and 100 when using Florida phosphate. Corresponding percentages of P_2O_5 extraction were 90, 94, 88, and 95. These results were obtained when the concentration of SO_3 in the first extractor was 7 to 8% for Tennessee matrices, 8 to 10% for calcined Idaho phosphate, and 1.3 to 1.5% for Florida phosphate; SO_3 concentration for Tennessee washed sand was not determined. Acid prepared from Tennessee matrix contained 20% P_2O_5, 7% SO_3, and 6% R_2O_3. Superphosphate made from this acid and ground Florida phosphate was not a satisfactory product because of its high hygroscopicity. However, by ammoniating with gaseous ammonia and drying, a product of low hygroscopicity that contained 9.6% nitrogen and 35% available P_2O_5 (2.6% citrate-insoluble P_2O_5) was obtained. Greenhouse tests of this product are being made. The low cost of matrix from which 78% of the P_2O_5 in the product is derived might make production of this material attractive at Tennessee locations. Phosphoric acid made from the other low-grade phosphates has not yet been tested in the preparation of superphosphate.

COMPOSITION AND PROPERTIES OF SUPERPHOSPHATE. EFFECT OF ALUMINUM AND IRON CONTENT UPON THE CURING OF SUPERPHOSPHATE. H. L. Marshall, Mathieson Chemical Corp., Baltimore, Md., and W. L. Hill, U. S. Department of Agriculture, Beltsville, Md.

Results are given for the distribution of phosphorus among the water soluble, citrate-soluble, and citrate-insoluble fractions of curing superphosphates which contained different amounts of iron and/or alumina. These superphosphates were prepared in small batches in the laboratory under standard conditions of acidulation and acid concentration. The iron and/or alumina content of the ingredient phosphate rock was varied by the addition of the corresponding phosphate salts. Superphosphates containing increasing amounts of iron showed an increase in citrate-soluble phosphorus at the expense of the water-soluble fraction as curing progressed. Superphosphates containing increasing amounts of alumina showed an increase in citrate-insoluble phosphorus at the expense of the water-soluble and citrate-soluble fractions as curing progressed. Combinations of iron and alumina showed an additive effect as regards the distribution of phosphorus among the several fractions, dependent upon which of the two elements was predominant. The transfer of phosphorus from one fraction to another appears to be related to both the type and the quantity of R_2O_3 present. R_2O_3 contents

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greater than 5% produce an appreciable effect on the phosphorus distribution. This change occurs during the first ten days of curing.

FORMS AND SOLUBILITY OF PHOSPHORUS IN MIXED FERTILIZERS. K. G. Clark and W. M. Hoffman, Bureau of Plant Industry, Soils, and Agricultural Engineering, U. S. Department of Agriculture, Beltsville, Md.

A survey was conducted of the commercial fertilizers marketed in the United States during the 1949-50 fertilizer season to obtain information on the distribution of their phosphorus contents among water-soluble, citrate-soluble, and citrate-insoluble forms. Information was desired also on the relative amounts of sand and liming materials used in formulating various mixtures.

To make the survey as representative as possible, samples were selected from each major geographical region on the basis of the tonnage of the several grades marketed and the production of individual manufacturers. Selections were based on the latest seasons for which the necessary information was available. Every principal grade was represented by a sample for each 50,000 tons. Manufacturers producing 25,000 tons or more of mixtures annually were represented by at least one sample. Other producers were included by random selection of a sample for each four manufacturers. State fertilizer control officials cooperated by supplying 1949-50 official inspection samples of the desired grades marketed by the specified manufacturers. Thus, more than 400 samples of commercial mixtures representing approximately 90 grades and 60 plant-food ratios were obtained from 25 states. State fertilizer control officials also supplied more than 90 samples of various grades of superphosphate for comparison with these mixtures.

In general, superphosphates were found to contain 6 to 8% more total phosphorus than the guaranteed grade. On the average, 96 to 98% of this phosphorus is present in available form and 85 to 90% of that available is present in water-soluble form. The acid-insoluble ash content of superphosphates was found to decrease appreciably with increase in P_2O_5 content.

For mixed fertilizers, the distribution of the available phosphorus between water-soluble and citrate-insoluble forms differed appreciably from that in superphosphate. The observed changes in these items and the increase in citrate insolubility may be attributed both to the ammoniation of the mixtures and to the incorporation of considerable quantities of liming materials.

That the formulation of several widely used grades of mixed fertilizers requires the inclusion in the formula of 10 to 15% and sometimes more "make-weight" material is indicated by the acid-insoluble ash and carbonate carbon contents of such grades. In some cases elimination of a major portion of this "make-weight" from the fertilizer formula would result in higher analysis grades of the same plant-food ratio, whereas in others accomplishment of this result would also require some replacement of normal superphosphate with concentrated superphosphate.

SOME FACTORS INFLUENCING THE EFFICIENCY OF FERTILIZER CONDITIONERS. John O. Hardesty and Rikio Kumagai, Division of Fertilizer and Agricultural Lime, Bureau of Plant Industry, Soils, and Agricultural Engineering, U. S. Department of Agriculture, Beltsville, Md.

Results of 1400 laboratory caking tests on mixed fertilizers, with and without the inclusion in the mixture of some 40 different conditioning agents, indicate that the ability of inert conditioners to prevent caking is largely dependent on the initial moisture content and particle size of the mixture, and on the amount of conditioner used. Five per cent of inert conditioner in a typical 10-10-10 mixture containing 4.3% moisture did not prevent caking but decreased the crushing strength of cake 0 to 63%, depending on the conditions used. When used at the rate of 20% in the same mixture, these conditioners decreased the crushing strength of cake 2 to 89%. There was no correlation between anticaking effect and the moisture-absorbing capacity of the conditioner or the classification of conditioners into organic and inorganic materials. One per cent of MgO in some mixtures was a more effective anticaking agent than 5% of any of the inert materials tested. With one or two exceptions the same was true of 2.5% of urea in the mixture. In general, the inclusion of such materials, as well as enlarging the particle of fertilizer by means of granulation, or drying of non-granular mixtures gave better anticaking effect than the use of 5% of any of the inert conditioners tested.

THE MULTIWALL PAPER FERTILIZER BAG, PAST PRESENT, AND FUTURE. W. Noyes Baker, International Paper Co., New York, N. Y.

Until the latter part of 1932 and early part of 1933, fertilizers were shipped in textile bags, mainly in burlap. It was during this period that the first experimental shipments in multiwall paper bags took place. It soon became evident that many fertilizers were sufficiently acid in reaction to attack paper, and steps were taken to build acid resistance into the bag. Similarly, other bag problems were successfully solved as they arose. The multiwall paper bag today successfully carries practically every type of fertilizer that is packed.

PHYSICAL PROPERTIES OF AMMONIUM NITRATE AMMONIA-WATER AND UREA-AMMONIA-WATER SOLUTIONS. E. A. Worthington, R. C. Datin, and D. P. Schutz, Solvay Process Division, Allied Chemical and Dye Corp., Hopewell, Va.

In spite of the very considerable usse of ammonium nitrate-ammonia-water and urea-ammonia-water solutions in the fertilizer industry, relatively little information regarding their physical properties has been published. Vapor pressure density, and solubility data for the binary systems ammonia-water ammonium nitrate-water, ammonium nitrate-ammonia, and urea-water are compiled in the International Critical Tables. Schultz and Elmore [Ind. Eng. Chem., 38, 296 (1946)] determined densities and vapor pressures of ammonium nitrate-ammonia water solutions containing 5 to 30% ammonia, and Janecke [Z. Elecktrochem., 36, 645 (1930)] reported vapor pressure and solubility data for the system urea-ammonia-water.

The present paper reports data for the solubilities, vapor pressures, and densities of ammonium nitrate-ammonia-water and urea-ammonia-water solutions in the ranges 0 to 75% ammonium nitrate, 0 to 65% urea, and 0 to 65% ammonia. The vapor pressure and densities were obtained in the temperature range 1° to 40° C., and solubilities between -10° and 60° C.

TECHNICAL PROBLEMS IN CONTINUOUS MIXING OF SOLIDS AND LIQUIDS IN FERTILIZER PRODUCTION. Walter J. Sackett, A. J. Sackett & Sons Co., Baltimore 24, Md.

The expanding use of ammonia solutions as an ingredient in fertilizer manufacture has created the need for equipment especially designed accurately to proportion and combine such solutions with the superphosphate present in the blend of solid ingredients.

In view of the inherent advantages, and high degree of success attained in many other industries to accomplish similar problems, serious consideration should be given to its employment by the fertilizer industry. The advantages offered by the continuous process are: Automatic flow control of the process ingredients results in a higher degree of accuracy in the chemical and physical control of the end product. Minimization of error over the manual weighing and measuring present in batch systems. Dissipation of a higher degree of reactive temperatures due to the uniform and continuous combining of the process ingredients. Lower equipment maintenance cost due to "end of the line" continuous ammoniation. Ammonia solutions are added just prior to the discharging of the end product from the production equipment.

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versity of Cincinnati, pointed out that the environmental health hazards produced by any chemical will be a function not only of the physical state of the compound, but also of the concentration to which human beings are likely to be exposed. Consequently, he reasoned, these are the prime considerations in relation to the public health not only with respect to the hazards involved in brief and sudden exposure to severe conditions, but also and particularly those associated with long continued, intermittent exposure to small amounts of the compound. When exposure to high concentrations of an insecticide brings about enough absorption quickly, all of these toxic compounds will, by their very nature, produce serious deleterious physiological effects.

Before accurate opinions concerning the physiologic effects of these materials under conditions of chronic exposure can be determined, it is necessary to have at hand and to evaluate carefully all the experimental findings and all the clinical evidence, to bring about a more rational basis for understanding.

A paper on the biological and chemical evaluation of pesticides was presented by Dr. James G. Horsfall and Saul Rich, Connecticut Agricultural Experiment Station, New Haven. They pointed out that pesticides may be assayed either chemically or biologically. Chemical analysis will reveal active ingredient, but little about its activity. It remains for bioassay techniques to assess properly the efficiency of a pesticide. The paper pointed out the difficulty in distinguishing by chemical analysis, between zinc ethylenebisdithiocarbamate and zinc dimethyldithiocarbamate, but differences in the susceptibilities of fungus spores disclose the information quickly. In short, the paper said, chemical assay is important to characterize the principal requirement of the pesticide; namely, efficacy of performance.

Kenneth Messenger, U.S.D.A. Bureau of Entomology and Plant Quarantine, Oklahoma City, discussed development in aircraft application of pesticides. He gave a brief history of development and use of aircraft in pest control, pointing out both the advantages and disadvantages involved. The relative merits of dusts and sprays were aired, as was the effect of drift in relation to effective application. He concluded with a discussion of the relation of equipment design and operation, to deposit and how such design and operation may affect man, animals, plant life and property.

Discussing spray concentrates in deciduous fruit production, a paper by J. Marshall and J. M. McArthur, Dominion Fruit Insects Laboratory, Summerland, B. C. told how hand spraying had largely been replaced by automatic concentrate sprayers. It was found that extensive use of parathion indicates that concentrate spraying is less hazardous than hand spraying because it is easier to provide adequate protection for a man driving a tractor than for individuals on foot operating conventional spray guns, the paper said.

W. W. Gunkel and O. C. French described developments in machine application of pesticides in their paper. They pointed out how machinery developments have come about because of the shortage and high cost of farm labor, the huge economic losses caused by pests and the grower's desire to obtain more timely application of pesticides. The paper then discussed specifically, machinery for applying insecticides, fungicides, weed control chemicals and soil fumigants..

"Pesticides, Laws, and the Chemist" was the title of a paper by Justus C. Ward, U. S. Department of Agriculture, Washington, D. C. He called on chemists to help solve problems of legislative nature by finding new materials which will destroy the unwanted species but will have low toxicity to desirable forms of life. He said that chemical research in the past has concerned itself with discovery of new products, leaving to others the problems of how to use them. In the pesticide field however, the marked increase in legislation to control and delay the use of hazardous materials is a considerable problem. Cooperation between chemists, pharmacologists, biologists, entomologists and others is essential, he said.

Dr. K. Starr Chester, Battelle Memorial Institute, Columbus, Ohio, presented a paper on "Evaluating the Need for Agricultural Pesticides." A summary of his paper is as follows:

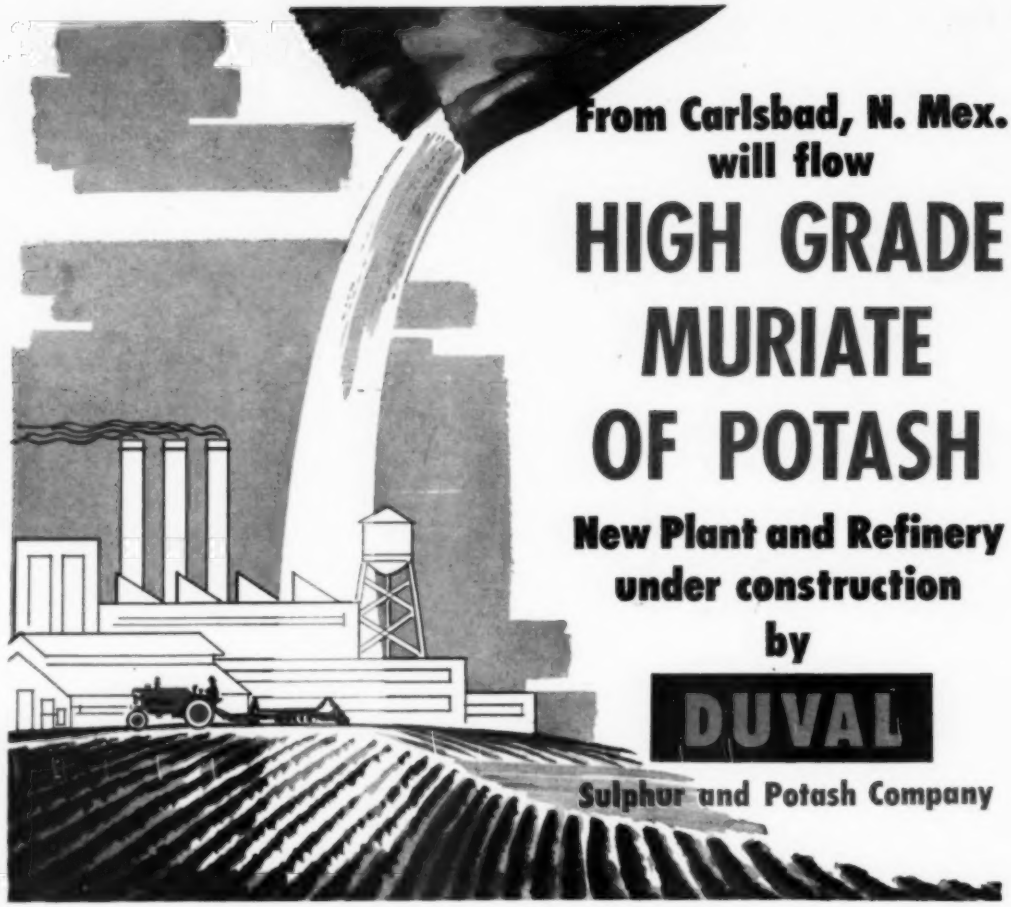
A knowledge of the amounts of loss caused by various plant and animal pests is essential to a rational program of research, education, and practice in pest control. Such knowledge is needed to guide international exclusion and quarantine activities for protecting crops and livestock. It is basic to the planning of new agricultural ventures and to the forecasting of agricultural production.

The problem involves accurate appraisal of the intensity of pest attack, translation of this into measures of agricultural loss, and interpretation of the impact of this loss on the agricultural and general economy. Loss appraisal has particular importance in times of national emergencies when manpower and pest control materials are scarce and the need for agricultural production is great.

We lack comparative data on the losses caused by various pests, and as a result, efforts at pest control have often been aimed at problems of secondary importance while more destructive pests have received less attention. For all leading pests means must be devised and applied for measuring their intensity and translating this into terms of agricultural production. A beginning in this direction has been made, but much remains to be done.

In the United States, the National Research Council has initiated a comparative study of the causes of livestock morbidity. Recently there was established by the International Union of Biological Sciences, cooperative with UNESCO, an International Commission on Plant Disease Losses, to serve as a clearinghouse on losses and loss appraisal, to catalyze studies in this field, and to furnish

(*Turn to Page 93*)



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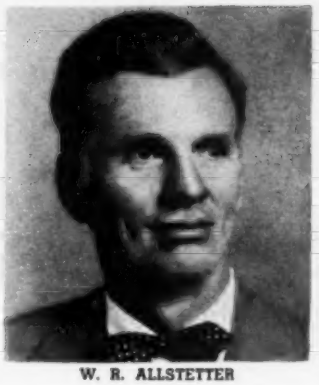

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CURRENT research and supply problems facing the fertilizer industry will be discussed at the 1951 fall meeting of the National Fertilizer Association, to be held November 12, 13 and 14 at the Atlanta Biltmore Hotel, Atlanta, Ga.

Addresses will be delivered at the November 13 session by W. M. Myers, Director of Field Crops Research, U. S. Department of Agriculture, Beltsville, Md. on "Potentialities in Grasslands Improvement," and by H. R. Krueger, Director of Technical Service, Phillips Chemical Company, Bartlesville, Okla. on "Safety in Fertilizer Plants." Mr. Krueger is a member of the Advisory Committee of the National Safety Congress. J. E. Totman, chairman of the Association's Board of Directors, will also address the gathering.

The November 14 program will feature a forum on government controls and orders affecting the fertilizer industry. Participants will include: W. R. Allstetter, Deputy Director, Office of Materials & Facilities, Production & Marketing Administration, U. S. Department of Agriculture; Cedric Gran, Consultant, Agricultural Chemicals, Office of Price Stabilization; Kenneth H. Klipstein, Director, Chemical Division, National Production Authority; and Sheldon P. Wimpfen, Division of Raw Materials, Atomic Energy Commission.

A meeting of NFA's Board of Directors will be held Nov. 12.

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The Listening Post

Report on General Insect Situation

This column, reviewing current insect control programs, is a regular feature of AGRICULTURAL CHEMICALS. Mr. Dorward is connected with the department of Insect Pest Survey and Information, Agricultural Research Administration, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, Washington. His observations are based on latest reports from collaborators in the U.S.D.A.'s pest surveys throughout the United States.

By Kelvin Dorward

THE cotton insect situation, in general, continued lighter during late August and early September than for the same period in 1950. Boll weevils were on the increase throughout the cotton growing area, but due to lateness of the season were not expected to cause serious damage. However, in Arkansas and Texas where there is a large acreage of late cotton, the population present could still cause damage. In southeastern Missouri indications were that the weevil survived the 1950-51 winter and with favorable weather conditions in September, damage could be greater than in 1950.

Boll weevils have been reported this season for the first time in several years, from Kentucky and Illinois. Bollworms were reported to be heavier in Arkansas than at any time in the last 9 years. They were also on the increase in South Carolina, Louisiana, Texas and Arizona. Control measures were used in the northwestern, northcentral and northeastern sections of Texas and the Salt River and Safford Valleys of Arizona. The cotton leaf worm, quite often a serious pest of cotton, has been reported this season only from six Texas counties, two Florida counties, and one Oklahoma county. Spider mites, during late August, were causing damage to cotton in Alabama, New Mexico, Virginia and South Carolina. They were spreading in Arkansas and reported from Arizona.

Truck & Vegetable Insects

MEXICAN bean beetle infestations during the latter part of August caused damage to beans in Maryland, Virginia, Georgia, Alabama, Missouri, and Utah. In Utah, the beetle had spread over a larger area than ever before. In early September the pest was causing serious damage on the lower Eastern Shore of Maryland and control was necessary in southern Georgia, northern Florida and northwestern Tennessee. Heavy infestations were also present in the Arkansas Valley of Colorado. Other bean pests reported during early September included bean aphid infestations in Delaware, Pennsylvania, Maryland and California and abundant infestations of the potato leaf hopper in Delaware, Ohio and Pennsylvania. The two-spotted spider mite caused damage to beans in Alabama and California and control was applied in Idaho and Washington. In late August, the Colorado potato beetle infested potatoes heavily in northwestern North Dakota and caused damage to eggplants in Tennessee. Tomatoes were damaged by the tomato fruit worm in Virginia, New Jersey, Tennessee, Mississippi and California and by hornworms in the lower Eastern Shore of Maryland, in Virginia, Mississippi and Louisiana. In late August aphids were causing damage to tobacco in Calvert County, Maryland. A general heavy infestation of hornworm was present on tobacco in Charles County, Md. The beet leaf hopper fall population was exceptionally large in the San Joaquin Valley of California where plans are underway to begin emergency spraying of Russian thistle about October to prevent spread of the pest.

Fruit Insects

DURING early September, second-brood codling moth larvae were still active in some New Jersey apple orchards. In the remainder of the apple areas injury was light with some insecticides being applied. During late August, the redbanded leaf roller was more injurious than usual in Massachusetts, New Jersey, New York, Pennsylvania and West Virginia. Second-brood larvae were damaging ripening peaches in Ohio, in September. Oriental fruit moth twig injury in some Massachusetts orchards was more abundant than in the last two years. The population of fourth-brood larvae in New Jersey was sufficient to cause possible damage to late varieties of peaches during September. During late August the two-spotted spider mite was more abundant than usual in the northeastern part of the country and was increasing rapidly in extreme southern Illinois where, unless controlled, damage was expected to result. European red mite populations were heavy in some New Jersey and Ohio orchards. A leaf miner caused damage reaching commercial levels in two northern Ohio peach orchards.

Cereal & Forage Insects

BY early September, the moth emergence of second-generation European corn borer was about complete throughout the corn belt states. Oviposition has been light with little possibility of high infestations developing. However, the populations present appeared to be spread rather uniformly over a large percentage of the fields. In late August on the lower Eastern Shore of Maryland, corn ear worm damage was common where the end of the ear was exposed. The insect was moderately abundant in southeastern Wisconsin

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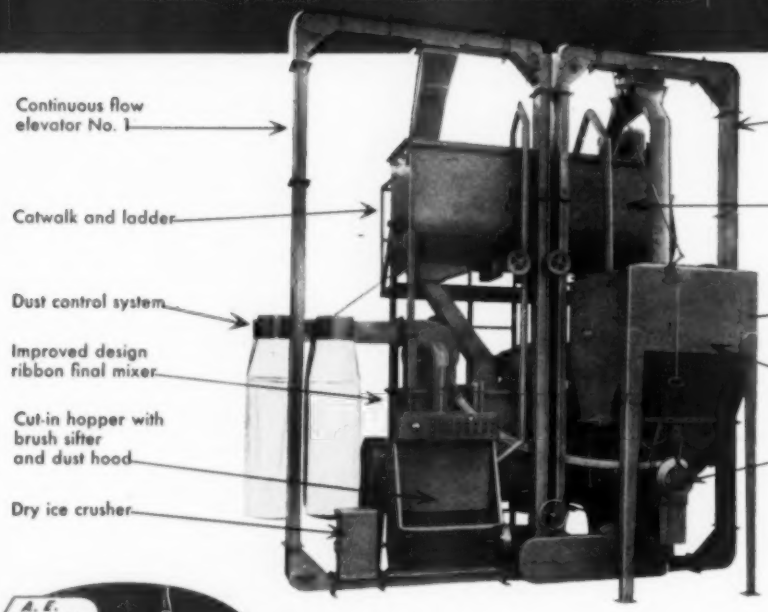
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during late August, and in early September was increasing on canning corn in northern Utah. Corn root worms caused considerable damage to corn in the eastern half of Nebraska during August. The fall army worm caused moderate damage to late corn in Maryland, to vegetables and lawn grasses in Florida, to lawns in Alabama, to hay crops and soy beans in Alabama, and general damage in Louisiana It was reported abundant on grasses in the Charleston, S. C. district, scattered over most of Mississippi and on corn generally over the State of New Jersey.

The extensive Wyoming range grasshopper control program conducted cooperatively between Federal and State Agencies and private land owners was concluded during August. The results were considered excellent and adult grasshopper surveys conducted immediately after cessation of control operations revealed that remaining populations in eastern Wyoming were light and spotted. Approximately 450,000 acres were treated this year as compared with 2,400,000 in 1950. In 1951 an aldrin spray (2 ounces of aldrin in a gallon of oil per acre) was used exclusively for range land work. Aldrin spray proved equally effective against all species of grasshoppers.

Adult grasshopper surveys during August in southeastern Colorado and western Kansas indicate that the grasshopper populations on the range are high enough to be serious threat to the grain crops in those areas.★★

Fungicide Tests Show Good Results

This department, which reviews current plant disease and insect control problems, is a regular monthly feature of AGRICULTURAL CHEMICALS. The comments on current plant disease problems are based on observations submitted by collaborators of the Plant Disease Survey Bureau of Plant Industry, Soils, and Agricultural Engineering, U. S. Department of Agriculture, Beltsville, Md.

By Paul R. Miller

CHARLES J. Gould, of the Western Washington Experiment Station, states that dry rot and botrytis rot, caused by the fungi *Stromatinia gladioli* and *Botrytis cinera,* have long been the most important corm diseases of gladiolus in western Washington. With the development of proper curing techniques and other practices, botrytis rot can be eliminated as a major menace. Dry rot, however, continues to be a serious threat. Corm treatment with "Tersan" has been found to give consistently good results, but not quite as good as desired. Consequently the search for a cheaper and better treatment has continued.

In 1950 tests in western Washington, a stock of Picardy very severely infested with dry rot was used. All obviously diseased corms were discarded and the others were dipped for one hour before being planted on May 9. The soil was a sandy loam, well-drained, with water supplied from overhead irrigation.

The "Tersan" and "Natriphene"-treated corms appeared stimulated by the treatment, whereas the "Mersolite W"-treated corms were definitely retarded. This was evident both in rate of emergence of plants from the ground and in rate of blooming (Table 1). "Mersolite" is a mercury compound (phenyl mercuric acetate) and its retarding effect was therefore not surprising since it was often seen with other types of mercury treatments of corms in western Washington.

What was surprising, however, was the condition of the corms at harvest time. The "Mersolite" plots produced the largest yields of healthy corms, followed by "Tersan," with the "Natriphene" being almost as poor as the untreated sets. Although there were more healthy corms in the "Mersolite" sets, the number of large corms was greatest in the "Tersan" set.

The total yield of healthy corms and their average weight increased as the concentration of "Mersolite" was reduced even though the percentage of diseased corms also increased slightly.

The "Mersolite" definitely appears to be promising for Dry Rot control, although additional tests will be made before recommending it for general use in western Washington. The delay of flowering is particularly important to our cut-flower growers. The above treatments were intentionally made an hour long in order to intensify the control and aggravate any possible injury. Perhaps the delay in flowering can be overcome without decreasing disease control by reducing the length of

Table I

Results of gladiolus dry rot control tests in 1950 in western Washington

Material	Concentration 1 lb. in:	Number Spikes cut by Sept. 15	Number Spikes cut by Oct. 20	Average height of Spikes inches	Weight in lbs. of healthy corms	Average weight per healthy corms in lbs.	Number of large (No. 1) corms	Percent of healthy corms by weight
None	—	152	257	35.8	9.4	.057	56	33.3
Tersan	6 gal.	241	427	36.9	26.8	.063	188	71.3
Natriphene	96 gal.	204	385	34.8	14.3	.059	77	44.4
	193 gal.	185	370	35.1	11.8	.063	67	37.7
Mersolite W	241 gal.	31	114	39.7	29.0	.050	90	97.3
	482 gal.	85	221	39.7	31.7	.054	145	94.3
	723 gal.	95	260	39.8	33.5	.056	124	93.1

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time of treatment to five or ten minutes, by using "Mersolite" at a more dilute concentration, or even by mixing some "Tersan" (which seems to stimulate) with the "Mersolite." These possibilities will be tested during the coming season. Meanwhile the station is continuing to recommend the use of "Tersan" (1 pound in 6 gallons of water for 10 minutes) or its dry form "Arasan" (as a dust) for dry rot control in western Washington.

Grape Dead-Arm Control

DEAD-ARM disease of grapevines, caused by the fungus *Cryptosporella viticola*, has required some form of control, particularly in the Sacramento and Lodi areas of California, according to Wm. B. Hewitt of the California Agricultural Experiment Station. The severity of the disease has varied with the season since it was first reported in 1935. Table grape varieties of *Vitis vinifera*, namely Tokay, Olivette blanche, and Cornichon, have been most severely affected by the disease in these areas.

Leaf, shoot, cluster, and cane spotting have been the most conspicuous symptoms of the disease. Killing of spurs, arms, and even entire vines has occurred after two or more consecutive seasons favorable to spring infections.

Experimental control plots have been maintained for several years to compare various pruning techniques and chemical sprays. A sodium arsenite spray applied in the late dormant season gave the most effective and consistent control of spring infections. The solution used was a commercial compound commonly sold as a weedkiller or for spraying grape vines to control black measles. The compound contained an equivalent of four pounds of arsenic trioxide per gallon. For dead-arm control, it was used at the rate of three quarts in 100 gallons of water. The dangers of the spray should be pointed out because it is poisonous and caustic. In some seasons, it has caused considerable damage to buds, spurs, and canes when the sodium arsenite solution apparently penetrated pruning wounds and leaf scars that had not plugged or healed before spraying. Spray damage has been reduced by applying the spray as late in the season as possible. If the spray was applied before pruning, the vines were pruned several days afterward, preferably even after a rain; and if the spray was applied after pruning, then the vines were pruned early in the fall and the spray application was made as late in the dormant season as possible or just before the buds began to open in the spring.

During the spring of 1950, dinitro sec. butylphenol triethanolamine 38% ("DN-289") was compared with sodium arsenite, sodium dinitro-ortho-cresolate 32% ("Elgetol"), and ferric dimethyldithiocarbamate (ferbam) 76% ("Fermate"). Concentrations of materials per 100 gallons of water were as follows: "DN-289," 2 quarts; sodium arsenite, 3 quarts, or an equivalent of 3 pounds of arsenic trioxide; "Elgetol," 1 gallon; and "Fermate," 3 pounds. Treatments were applied to individual rows of 20 to 30 vines, randomized, and each separated by a row of non-sprayed control vines. They were replicated in three separate blocks. Results were obtained by counting the total number of shoots, and the number of diseased shoots on each of ten separate vines in each row. The vines averaged from 37 to 40 shoots each. Non-sprayed control vines averaged 13.7 diseased shoots per vine; sodium arsenite, 1.4; "Elgetol," 5.7; "Fermate," 8.7; and "DN-289," only 2.6.

The severity of the disease in 1950 was only moderate, but it was fairly evenly distributed over the plot and the disease counts were uniform and consistent. "DN-289" appears to have considerable promise as a spray control for the spring infections of dead-arm and is also prob-

(*Turn to page 99*)

Table 2

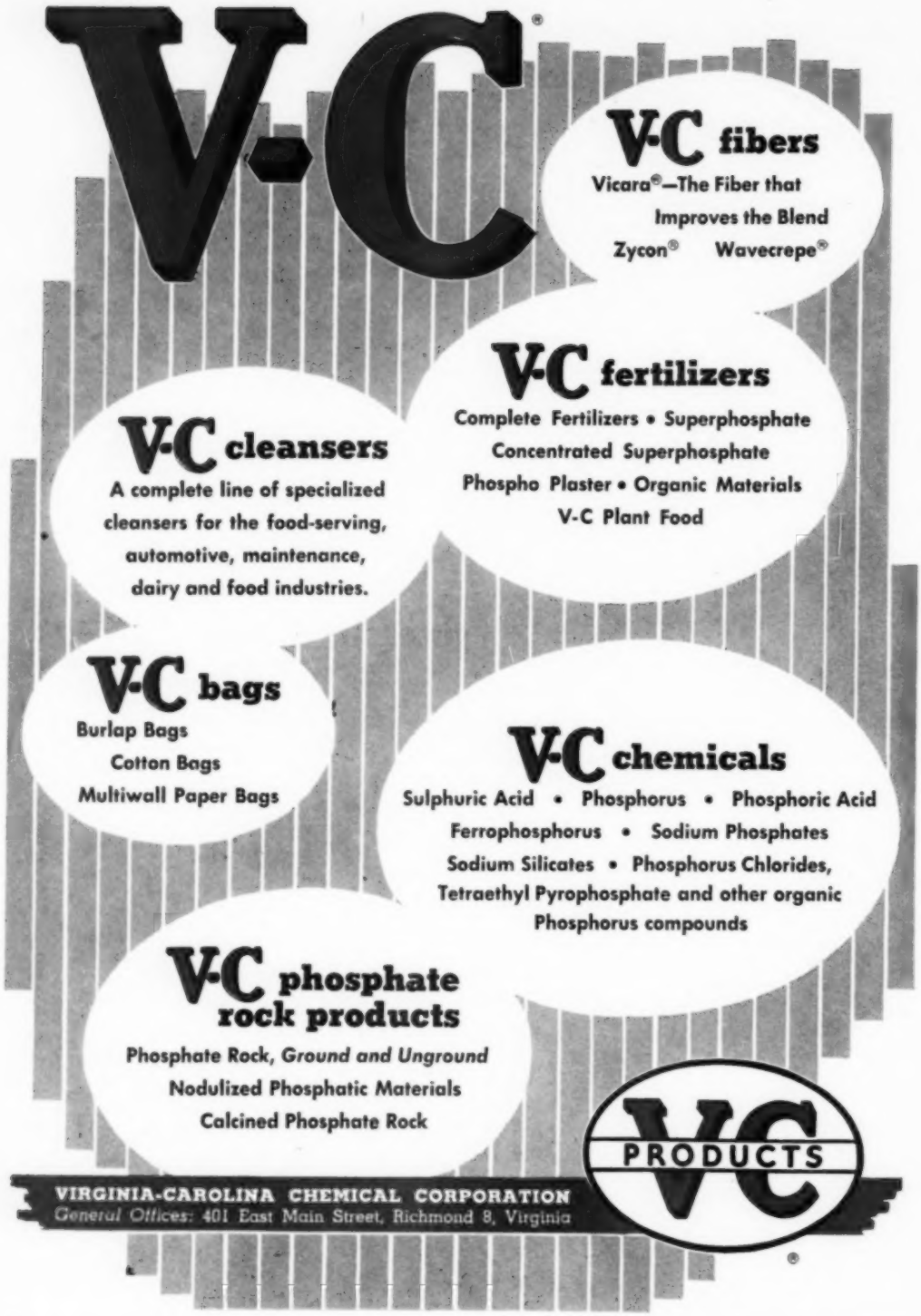
Peach brown rot blossom blight infection in Illinois tests, 1949, (Variety Red Bird).

Treatment to 100 gallons of water		Mean blossom infection
Pink, April 1	Bloom, April 5	
Liquid lime sulfur, 1 gallon	Phygon XL, ½ lb.	5.8
Sulfur past. 4 lbs.		
"	Ferbam, 1 lb.	13.7
"	Bioquin 1, ¼ lb.	14.9
"	Sulfur, 3 lbs.	
"	CR 305, 1 lb.	15.4
"	Ziram, 1 lb.	15.5
"	Sulfur paste, 8 lbs.	18.0
"	None	28.0

Table 3

Peach brown rot infection in Illinois tests, 1950. (Variety Elberta)

Treatment to 100 gallons of water	Mean blossom infection May 12	Number blight cankers per 100 twigs May 12	Percent fruit infection		
			July 24	Aug. 8	Aug. 14
Phygon XL, ¼ lb.	1.0	2.6	1.45	7.00	6.40
Wettable sulfur, 3 ¼ lbs.					
Wettable sulfur, 8 lbs.	7.0	5.0	2.00	11.00	17.00
Check, no treatment	15.1	7.1	—	—	—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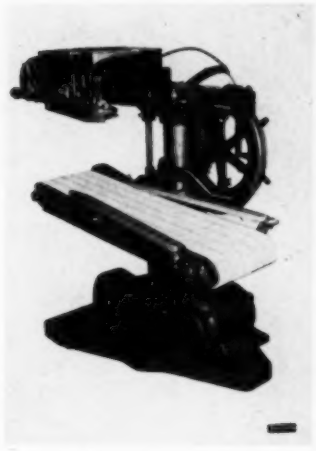
Suppliers' Bulletins

Automatic Bagger Offered

Hamer Machine Co., Minneapolis, has announced a fully auto-



matic bag closing machine capable of closing up to 2,000 paper bags an hour. The machine requires no attendant, the makers state, and is designed for low-cost, mass-production packaging of bags weighing from two pounds to 100 pounds when filled.

Five new models, each designed for bags within specific capacity ranges are now in production by the company. Complete descriptive literature is available by writing to Hamer Machine Co., 6417 Cambridge St., St. Louis Park, Minnesota.

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New Chase Booklet

A new booklet titled "Worth Looking Into" is being distributed by Chase Bag Company. Through its 16 pages, the booklet describes the company's purchasing policies, laboratory, research, engineering and manufacturing facilities; and illustrates the complete line of textile, paper and film containers and packaging materials made by the 104 year old firm.

Copies may be obtained by writing to Chase Bag Company, General Sales Office, 309 W. Jackson Blvd., Chicago 6, Ill.

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New Eston Bulletin

Eston Chemicals, Inc., Los Angeles, Calif., recently issued a seven page bulletin on "Alkron Eston Parathion." The booklet describes the chemical properties of parathion and lists various classes of "Alkron" for different types of spraying. General uses of "Alkron" are listed and precautions for use of the chemical are given.

•

Impregnation Brochure

F. J. Stokes Machine Company has issued a new book on vacuum impregnation in which the process is explained, a detailed list of applications is given, and equipment used in vacuum impregnation is described and pictured.

Vacuum impregnation, which introduces an impregnating agent into a chamber where a high vacuum has been drawn, is a versatile process used in many fields. Its function is adaptable to the insecticide field. Write the Company 5500 Tabor Rd., Philadelphia, Pa.

•

Plane Spraying Bulletin

The U.S. Department of Agriculture has issued bulletin E-823, "Airplane Spraying for Forest Pest Control," by J. S. Yuill, C. B. Eaton and D. A. Isler. The bulletin contains information on the advantages and limitations of aerial spraying, types of aircraft and spray equipment used; spray mixtures and spraying operations; and methods of evaluating results. Precautions in the use of DDT are listed, and in an appendix, illustrations are presented on how to estimate deposit and atomization.

Comic Book Issued by NFA

National Fertilizer Association, Washington, D.C., has produced a new type public relations booklet in the form of a comic book entitled "The Conquest of Hunger," a 16-page publication, in color. Character of the story is "Prosper Plenty," a

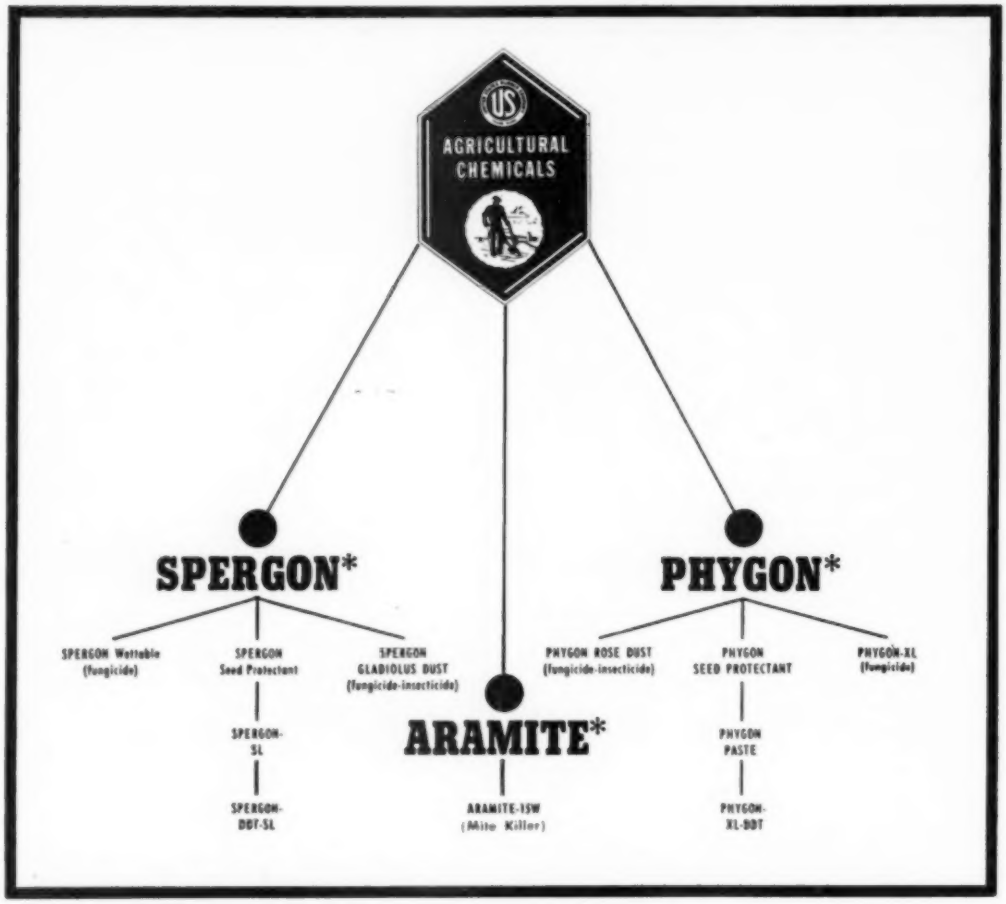
symbolic messenger for chemical fertilizers. The book is designed to meet the need for a colorful, dramatic and easy-to-understand presentation of the history, development and economic importance of the fertilizer industry and the services it renders.

Copies have been sent out to the NFA membership which has been invited to purchase copies at $4 per hundred. Further information is available from the National Fertilizer Association, 618 Investment Bldg., Washington, D.C.

•

New Bin-Level Indicator

The Bin-Dicator Co., Detroit, Mich., has marketed a new bin-level indicator which it says gives dependable level indication in large bins. It is designed for suspended installation from above and may be located anywhere within the bin where there will be a free flow of material to and from the diaphragm. The unit is designed to be drilled and tapped to take any size pipe up to 2". The support pipe also accomodates electrical wiring, making conduit unnecessary, the makers state. For further details, write the Bin-Dicator Company, 13946-37 Kercheval, Detroit.



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Technical Briefs

Factors Affecting Toxicity

In laboratory and greenhouse tests, spray formulations of toxaphene, aldrin and dieldrin proved to be more effective for boll weevil control than did the dust formulations. Considerably higher dosages of these insecticides applied as spray emulsions were necessary to give a kill in the field comparable to that in either the laboratory or greenhouse. Since the temperatures did not vary much in either location, it is assumed that the wider range in percentage relative humidity, sunshine, dew and wind or a combination of these factors, brought about a decided reduction in the toxicity of toxaphene, dieldrin and aldrin. These factors reduced the toxicity of aldrin more than either toxaphene or dieldrin.

The application of 0.5 inch of simulated rain did not affect the toxicity of either toxaphene or dieldrin sprays when used for boll weevil control in the laboratory. The toxicity of aldrin spray was, however, greatly reduced by the simulated rain.

Considerably higher dosages of toxaphene, dieldrin and aldrin were required to give kill of weevils in late September and October comparable to that obtained in August. It is assumed that certain factors other than environment greatly affect the toxicity of these insecticides. These factors probably involve the physiology of the weevil itself.

Spray formulations of gamma benzene hexachloride, toxaphene and *Q-137* (1.1 bis(P-ethyl phenyl) 2.2 dichloroethane) proved equally effective for leafworm control. The spray formulations of gamma benzene hexachloride and toxaphene were more effective for leafworm control than the dust formulations. The application of 0.5 inch simulated rain reduced the toxicity of the spray formulation to a certain extent, but the toxicity of the dust formulations was reduced sufficiently to make them ineffective. Even though 0.5 inch of simulated rain reduced the toxicity of the sprays, the excessive amounts of these insecticides which are generally used in field applications for the control of other cotton insects would probably remain effective for leafworm control following at least 0.5 inch or more of rain.

No differences were found in the toxicity of toxaphene sprays made from miscible oil concentrates containing three different emulsifiers in tests for boll weevil control. In tests for salt-marsh caterpillar control, there was a difference in the toxicity of the sprays made from oil concentrates containing these different emulsifiers. The toxicity of two of the emulsifiable sprays was reduced by the simulated rain in the experiment in which salt-marsh caterpillars were used as the test insects. Apparently the type of emulsifier used in making the miscible oil concentrate affects the toxicity of the spray emulsion as well as its residual toxicity following rains.

Dieldrin spray proved more toxic to the salt-marsh caterpillar than either of the toxaphene sprays. Toxaphene spray proved as toxic to the salt-marsh caterpillar as aldrin spray at the high levels of mortality. The toxicity of aldrin sprays was greatly reduced by simulated rain. The toxicity of the dieldrin sprays was not reduced by simulated rains as much as were the aldrin sprays.

One-half inch of simulated rain greatly reduced the toxicity of toxaphene-sulphur dusts. The addition of either oil or a commercial sticker to toxaphene-sulphur dusts had little or no effect on the residual toxicity following simulated rain.

—Summary of article, "Effect of Rainfall and Other Factors on the Toxicity of Certain Insecticides," by J. C. Gaines and W. J. Mistric, Jr., Texas Agricultural Experiment Station, in *J. of Economic Entomology*, Vol. 44, No. 4, August 1951.

Lindane Increases in Agricultural Use

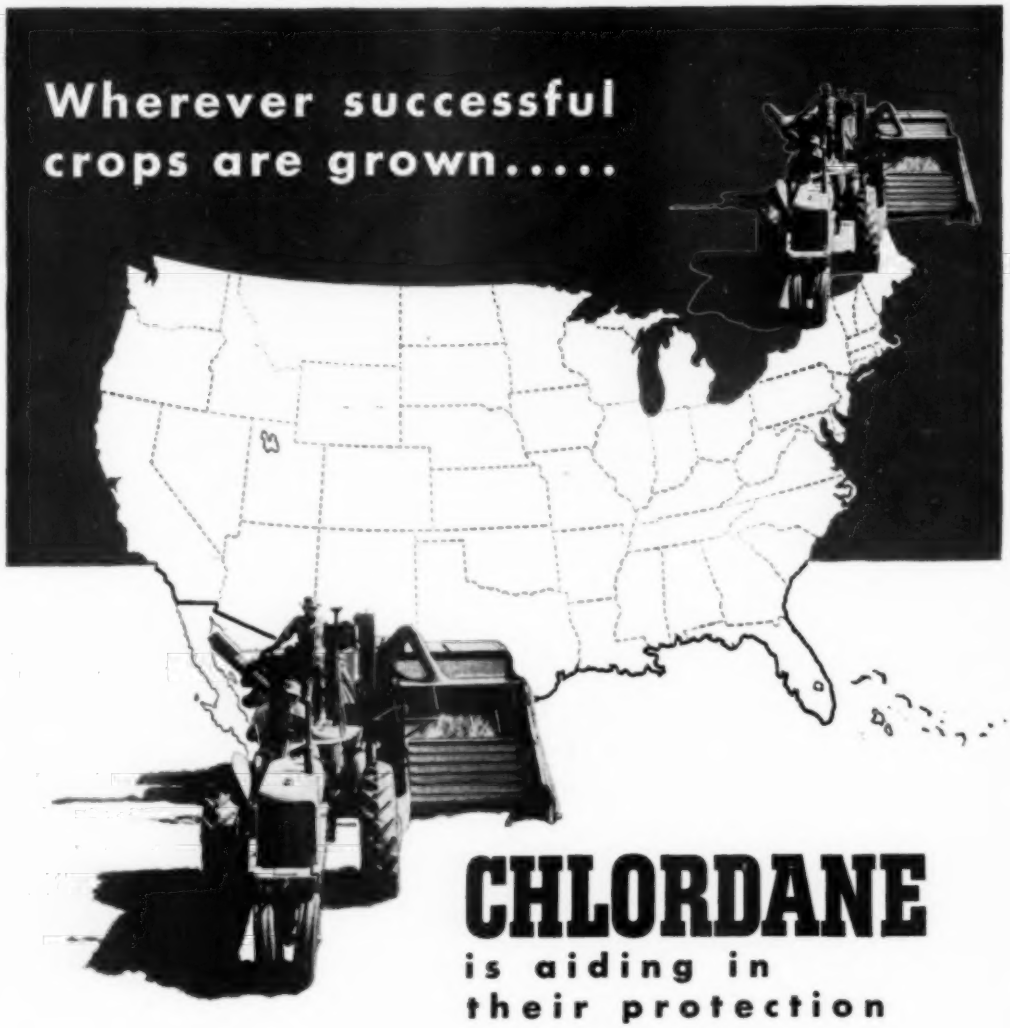
LINDANE, the nearly pure gamma isomer of benzene hexachloride, is considered by many entomologists to be the most modern and versatile of insecticides being used at the present time.

Although BHC is the parent compound of lindane, it has many completely different properties and characteristics. At first, when developed in England during World War II, commercial grades of BHC contained not over 13 percent of the gamma isomer and approximately 87 percent of the other four isomers in mixed proportions as well as a small amount of other related impurities. It was soon found, however, that the insecticidal action of BHC was contained in the gamma isomer and that the other isomers imparted odor or other undesirable properties.

Upon the introduction of BHC to the U. S., tests here indicated that use of the gamma isomer without the presence of other undesirable isomers of BHC, would be an excellent insecticide. During 1946 and 1947, experimental lots of the material were developed, with a gamma isomer content of about 95%, leaving a small percentage of the other isomers still remaining. In 1948, however, 99 percent gamma was obtained, and in the same year up to 100 percent gamma material became a reality. Today's production averages 99.5 percent gamma and much of it is 100 percent.

Among the important properties of lindane are its excellent killing power and residual quality. It is more efficiently toxic to insects than commercial BHC, and approximately 5 to 10 times as toxic to insects as DDT, making smaller dosages possible.

The versatility of the com-



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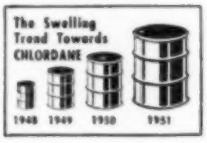

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pound is such that new uses for it are still being discovered. Five years of experimental work have indicated that it controls more species and types of insects in the form of animal and plant pests than any other insecticide in use now or previously. This is largely due to its three-way insecticidal action of being a stomach poison, contact poison and vapor action poison. This is unusual, of course, and is a property not displayed to such an extent in any of the related organic insecticide compounds.

The toxicity of lindane to warm blooded animals is favorable. In chronic toxicity, it is about ¼ as toxic as DDT and shows practically no dermal toxicity. The oral toxicity is likewise low. In addition, lindane does not build up in body tissues as does DDT but is eliminated at approximately the rate of intake. Therefore it is not dangerous to be taken into an animal's body through use or other method. It has been approved by U. S. Department of Agriculture for dairy barn spraying and for spraying of dairy cattle for certain difficult-to-control parasitic infestations such as mange and scab. It is also possible to use it to some extent on certain crops close to harvest time because residues disappear fairly quickly.

In addition to being versatile, lindane also offers a wide range of possibilities in formulation. It can be formulated into wettable powder concentrations of almost any strength; it can be formulated into dusts of from one to two percent or as desired; it can be formulated into excellent emulsive or liquid concentrate formulations at the approximate range of 1¾ pounds per gallon of solvent carrier. Lindane likewise has a very good solubility in quite an effective range of solvents.

Agricultural use of lindane embraces three major applications: on crops, on animals, and as a soil insecticide. The crop uses include various formulations for control of comprehensive range of insects. These include aphids, alfalfa weevil, army worms, various caterpillars, plant bugs, *Diabrotica* beetles, earwigs, grasshoppers, wireworms and other soil insects. As with other insecticides, applications to crops must be made under certain specific conditions and with timing depending on the development of the crop.

The use of lindane on animals has produced excellent results. It controls all varieties of flies and in addition, is effective for the control of mange on cattle and other animals. It also controls both the Sarcoptic and Psoroptic manges, being the only modern insecticide for which such a claim can be made. Lindane will also control lice, fleas, ticks, sheep ticks, mosquitoes and other animal-infesting insects.

One type of insect control developed using lindane in combination with DDT is a liquid screw-worm remedy. When applied to wounds or screw-worm infested wounds, it results in prevention of infestation. If maggots are in wounds the preparation forces them out, killing the maggots and preventing re-infestation for several days, while promoting rapid and clean healing. Lindane can be employed generally on animals. High dosages are not required.

Soil insects controlled by lindane include wireworms, various maggots and other insects inhabiting soil areas. For controlling wireworms, it can be applied effectively in a ratio of a few ounces to each 100 pounds of seed prior to planting time. It can also be applied effectively for wireworm control as a wettable powder, dust or liquid formula application. The persistence in soil varies with amounts applied and in the case of potato land, annual rotation is required if treatments up to ½ pound per acre are used. Ordinarily, ¼ pound of actual lindane per acre is sufficient for effective wireworm control.

In general usage, lindane has been found to be compatible in all formulations with the various other insecticidal materials in use at present including DDT, and others, as well as fungicides such as coppers, the carbamates and sulfur. Many excellent combination formulations of lindane are being produced for agricultural work both in the plant and animal use fields.

—Abstract of article by G. S. Hensill, California Spray Chemical Corp., Richmond, Calif., in Soap and Sanitary Chemicals, September, 1951

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Spray Mix Instructions

Oklahoma Agricultural Experiment Station, Stillwater, has issued miscellaneous publication number MP-23. A Graphic Method of Calculating Spray Mixes. Written by James E. Garton and M. J. Morgan, this bulletin contains several graphs used to calculate variables in mixing sprays. The bulletin covers liquid concentrate and wettable powder problems and can be used to determine variables such as the number of gallons of spray mix to be applied per acre, the number of pounds of actual insecticide per gallon of concentrate and the number of gallons to be mixed.

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New Technical Book

Fundamentals of Soil Science by C. E. Miller and L. M. Turk. Second Edition. Published by John Wiley & Sons, Inc., New York. 510 pages, 6 x 9 inches, cloth binding, price $5.50.

The general principles of soil science and the application of the fundamentals and concepts to the past problems of how to utilize soil to the best advantage, are emphasized in this second edition of the text. The revised edition contains a new chapter on Soil Conservation, including colored illustrations dealing with nutrient deficiency symptoms.

Discussions of particular interest to the agricultural chemical field are included in the chapters: on Lime and Its Use, which contains a review of the response of crops to lime; Farm Manures, which includes discussions on handling and fertilizing properties of manure; Fertilizers and Fertilizer Materials, which reviews phosphatic, potassium, nitrogen, and mixed fertilizers..

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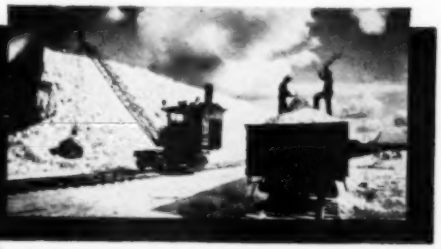
Loading operations at our Newgulf, Texas mine



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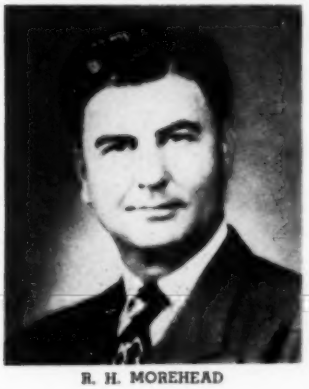
INDUSTRY NEWS

Mathieson Names Morehead

R. H. Morehead has been appointed sales manager of the Arkansas Fertilizer Division of Mathieson Chemical Corporation with offices in Little Rock, according to an announcement made by S. L. Nevins, vice president - director of agricultural chemical sales. He will fill the position recently vacated by the death of W. W. Knight, Jr.



R. H. MOREHEAD

Mr. Morehead, who attended Texas A & M, was at one time an agricultural agent for the Southwest Stone Co., Dallas, Texas. From 1940 until 1945 he was a supervisor in the Farm Home Administration of the U. S. Department of Agriculture. He joined Mathieson in July, 1947, as a salesman, southwestern sales division, Houston, Texas, and was later made assistant sales manager. In November he was appointed assistant district sales manager of Mathieson's Arkansas Fertilizer Division, which position he held at the time of his present appointment.

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East'n. Branch AAEE, Meets

The twenty-third annual meeting of the Eastern Branch of the American Association of Economic Entomologists will be held at the Hotel New Yorker, New York, November 15 and 16, according to Dr. B. F. Driggers, secretary-treasurer of the Branch.

With the deadline for paper titles set at October 31, the program was not complete at press time, but the committee was expecting to present a broad scope of entomological subjects at the November meeting. Chairman of the meeting is Dr. F. H. Lathrop, Maine Agricultural Experiment Station, Orono, Me., and vice-chairman is Dr. Floyd F. Smith, U. S. Department of Agriculture, B. E. P. Q., Washington, D. C. These, with Dr. Driggers, are working out details of the program.

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Porter to Ethyl Corp.

Richard P. Porter has been appointed to the product development staff of Ethyl Corporation, New York. Mr. Porter, a plant pathologist, will assist Dr. Charles L. Smith, in charge of development work on agricultural chemicals. Mr. Porter's duties will be to assist in the development of new agricultural chemicals, to participate in field tests and cooperative work with experiment stations, and to acquaint organizations in the field with Ethyl's growing activities in agricultural chemicals. In addition to benzene hexachloride, which Ethyl manufactures and distributes throughout the cotton states, the Corporation's research laboratories have investigated a number of other agricultural chemicals.

Mr. Porter has an extensive background in the field of agricultural chemicals, with particular emphasis on the diseases of principal crops. He served as assistant plant pathologist at the Virginia Truck Experiment Station, Norfolk, Va., from 1942 to 1944, and for the next three years was manager of the quality control department of the W. Atlee Burpee Co. Prior to joining Ethyl, he was associated with Innis, Speiden and Co. as assistant manager of the insecticide department.

New BEPQ Research Div.

A new research Division in the Bureau of Entomology and Plant Quarantine, the Division of Stored Product Insect Investigations, in which research will be conducted on the control of insects that destroy stored products, has been announced by the U. S. D. A. Randall Latta has been designated acting leader of the new Division, by Avery S. Hoyt, chief of the Bureau. His first assistants will be R. T. Cotton, and Dr. Lyman S. Henderson, bureau authorities on the control of insects that might affect stored products in home and commercial establishments.

RANDALL LATTA

It is pointed out that the average annual value of grain destroyed by insects is around a billion dollars and that much of this loss occurs after the grain is harvested and is in farm storage. Dried fruits, nuts, candy, dairy products, cured meats, cereals, spices, breakfast foods, spaghetti, and numerous other stored food products and tobacco also are subject to great losses. Control of these insects, it is estimated, will increase the cereal food supplies of the nation at least 10 percent.

Investigations concerning insects that affect stored products have been conducted in a number of the Bureau's research Divisions.

Cyanamid Makes Appts.

Election to new posts of several American Cyanamid Company executives were announced recently by Raymond C. Gaugler, president.

E. D. Powers, vice-president in charge of production, was elected to the board of directors. He succeeds H. P. Eastman who retired August 31st. A. J. Campbell, general manager of the industrial chemicals division, and Howard Huston, formerly assistant to the president, were elected vice-presidents. L. C. Duncan was elected assistant to the president.

Other executive changes announced were the election of J. J. Murray and G. C. Walker as assistant treasurers, and J. W. King and W. B. Ward as assistant comptrollers.

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Studies Corn in U. S.

Joaquin Bustamante, representative of the Spanish Agricultural Society, is in the United States engaging in corn research with the United Hybrid Growers' Association in Shennandoah, Ia.

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"Cal-Nitro" Not Generic

That the name "Cal-Nitro" is trademarked by Synthetic Nitrogen Products Corp., New York, was called to the attention of *Agricultural Chemicals* by M. Tegtmeyer, executive vice-president and treasurer of the firm in a recent letter.

Mr. Tegtmeyer referred to an article by Clark and Hardesty in the September issue, in which the term "Cal-Nitro" was used in a generic manner. "For your information, the word 'Cal-Nitro' is a trademark registered in the U. S. Patent Office and owned by this Corporation," writes Mr. Tegtmeyer.

"It is used to designate a product which is manufactured in this country at Hopewell, Va., under process patents also owned by this Corporation. The product which we sell under the trademark 'Cal-Nitro' is not identical with those referred to in the article.

"The authors were in error in using our trademark to designate the products they were describing. We believe this to be damaging to our own trademark 'Cal-Nitro'."

In replying to Mr. Tegtmeyer's letter, K. G. Clark wrote as follows: "The authors regret their oversight in using the trademark term 'Cal-Nitro' in describing the ammonium nitrate-limestone mixtures produced and marketed by Staatsmijnen in the Netherlands under the designation KAS or kalkammonsalpeter. The authors intended their use of 'Cal Nitro' to be generic in this connection to provide the reader with a familiar basis of comparison, rather than as a specific decription of the American-made product or of its method of manufacture."

The article involved was entitled "Treatment of Phosphate Rock with Nitric Acid." Both authors are connected with the U.S.D.A. Division of Fertilizer and Agricultural Lime, Beltsville, Md.

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Baumgard, Inventor, Dies

William H. Baumgard, founder and owner of Arrow Products Co., Carlstadt, N. J., died August 27. He was the inventor of a patented opener for single-pound cans of Methyl Bromide as well as larger applicators to dispense the material from large cylinders into chambers and warehouses. His widow, Carrie, is managing the business at present.

•

80% BHC by Ethyl Corp.

Pilot plant production of an 80% gamma isomer BHC product has been announced by Ethyl Corporation, New York. The material, manufactured at the firm's plant at Baton Rouge, La., is expected to be used as a cotton spray. It has less tendency to burn plants, due to the removal of most of the delta isomer and associated higher chlorination products of BHC in the process. The plant at Baton Rouge is capable of producing both lindane and the 80% BHC, the company reports.

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Delaney Hearing Resumes

Resumption of the Delaney Committee Hearings was scheduled for October 9 in Washington, according to an announcement by Rep. James J. Delaney, chairman of the Select Committee investigating the use of chemicals in food products.

Scheduled to appear at this session were E. L. Griffin and John R. Magness, both of the U. S. Department of Agriculture. Mr. Griffin was to testify on the Insecticide, Fungicide and Rodenticide Act and Mr. Magness on the use of chemicals for disease and decay control in fruits and vegetables.

•

N. E. Phytos. to Meet

November 6 & 7 are the dates of the Northeastern Division of the American Phytopathological Society meeting at West Springfield, Mass., according to an announcement by Dr. S. G. Younkin, Campbell Soup Co., Riverton, N. J., secretary.

Deadline for paper titles was set for October 15, according to Dr. Younkin.

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Prentiss Names Abbot

S. L. Abbot Co., San Francisco and Los Angeles, Calif., has been appointed west coast representative for Prentiss Drug & Chemical Co., New York, according to Harold R. King, Prentiss president.

Abbot will represent Prentiss on the company's entire line of pesticides including warfarin, pyrethrum, DDT compounds, lindane, rotenone, sabadilla and other chemicals.

S. L. Abbot, Sr., S. L. Abbot, Jr., and Robert J. Connolly are principals of the firm in San Francisco, with Milton Dyke in Los Angeles.

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Expands Nitrogen Capacity

Solvay Process Division, Allied Chemical and Dye Corp., New York has announced plans to expand nitrogen capacity by 100,000 tons per year. The expansion program will take about two years and the Hopewell, Va. and the South Point, Ohio plants will be expanded. Since 1946, the annual capacity of the Hopewell and South Point plants has been increased by 80,000 tons of nitrogen.

IMC Names MacDonald

Robert A. MacDonald has been appointed head of the Development Department of the Plant Food Division of International Minerals & Chemical Corporation, according to

ROBERT A. MacDONALD

Maurice H. Lockwood, vice-president in charge of that division. Until his recent transfer to the Plant Food Division, Mr. MacDonald was a member of the research group at the corporation's potash refinery at Carlsbad, N.M.

In his new assignment, Mr. MacDonald will direct the development phase of projects after the Research Division has completed its work on them and the Production Department of the Plant Food Division puts them into use. He will report to John W. Rutland, general manager of the Plant Food Division.

Mr. MacDonald is a graduate in chemical engineering of the University of Minnesota. Before joining International's Research Division in 1947 he had served in both research and chemical engineering capacities on the staff of the Minnesota Mining & Manufacturing Company.

•

Leases Big Plant for N

Mathieson Chemical Corp. has leased the army's Morgantown (W. Va.) Ordnance Works and expects to produce ammonia there. The plant will be operated by Mathieson under a lease negotiated between the company and army engineers, according to Undersecretary of the Army, Archibald S. Alexander. Although announcements of the move were made early in September, negotiations and execution of the leasing arrangements had not yet been made, but they were to be completed in from "thirty to sixty days." Initial operation of the plant will begin within four months after Mathieson takes over, and full production will be reached in about four months from the beginning of operations.

Mathieson was one of three firms responding to the army's invitation for bids in June. The other two bidders were Allied Chemical & Dye Corp. and United Distillers of America, Inc.

Built by the U. S. Government in World War II, the plant was operated at first by E. I. duPont de Nemours & Co., Inc. However, in 1945, the plant was closed, only to reopen in 1946 to supply fertilizer materials to areas occupied by U. S. armed forces overseas. This operation was terminated last year.

MEETINGS

California Fertilizer Association. Hotel Californian. Fresno. Calif., November 1-3.

13th Annual New York State Insecticide and Fungicide Conference, and third annual Pesticide Application Equipment Conference. Ithaca, N. Y., Nov. 7-9.

Cotton Mechanization Conference. Cotton Branch Experiment Station. Chickasha. Oklahoma. Nov. 8 & 9.

National Fertilizer Association Fall Meeting. Atlanta Biltmore Hotel. Atlanta. Ga., November 12-14.

Eastern Branch. AAEE. New Yorker Hotel. New York. Nov. 15 & 16.

Western Weed Control Conference Vancouver Hotel. Vancouver, B. C., November 27-28

Combined meetings of American Association of Economic Entomologists; Entomological Society of America; American Phytopathological Society; and the Potato Association. Netherland Plaza Hotel. Cincinnati. Ohio. Dec. 9-13.

North Central Weed Control Conference. Biltmore Hotel. Oklahoma City. Okla., December 11-13.

Northeastern States Weed Control Conference. New Yorker Hotel. New York City. Jan. 2, 3 & 4, 1952.

11th Annual Meeting. Northwest Vegetable Insect Conference. Imperial Hotel. Portland. Oregon. January 21-23, 1952.

V-C Appoints Dr. Boyer

Virginia-Carolina Chemical Corporation has announced the appointment of Dr. William P. Boyer as director of its Research Department with offices and laboratories in

DR. WILLIAM P. BOYER

Richmond, Virginia.

A native of Orange, Virginia, Dr. Boyer is a graduate of Virginia Military Institute and received his doctorate from the University of Virginia, majoring in organic chemistry.

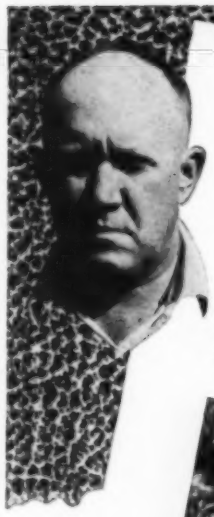
During World War II he served as a major in the Tank Corp of the U.S. Army in California, and upon his release from active duty, he remained in that state to continue research on ion-exchange.

Later he returned to Virginia as a professor at V.M.I., where he was also a consultant to V-C at the time of its initial research into the field of organic phosphates. He joined the Richmond firm on July 1, 1947, as head of its research group on organic phosphates. When the corporation centralized its research activities in 1949, he was named assistant director under Robert B. Arnold, retired, whom he succeeds as director of research.

•

Fertilizer Exec. Dies

Wm. M. Patience, 56, an executive of Darling & Co., Chicago, died September 9 after apparently being robbed while returning to his home from a night baseball game. Police were checking a number of clues at press time but no solution to the mystery had been announced.



Pastures treated with 8-8-8 carried 30% more cattle for Beryl Wayt, Michigantown, Ind.

"I applied 8-8-8 at the rate of 400 pounds per acre on 25 acres of Big English bluegrass and ladino clover," says Mr. Wayt. "I also applied 400 pounds of 0-12-12 on 10 acres of the same mixture. The pasture treated with 8-8-8 carried 30 per cent more cattle per acre than the pasture treated with 0-12-12."

400 pounds of 0-12-12 fertilizer per acre.

400 pounds of 8-8-8 complete fertilizer per acre.

USS AMMONIUM SULPHATE UNITED STATES STEEL

Bigger yields for farmers ...better business for you

● Experiences like that of Mr. Wayt are convincing farmers that high-analysis mixed fertilizers point the way to bigger yields and bigger profits every time.

You can obtain your full share of this business by including in your line high-grade complete fertilizers in which U·S·S Ammonium Sulphate provides a major part of the nitrogen. Fertilizers containing U·S·S Ammonium Sulphate stand up well in storage . . . perform well in drills and other distributing equipment . . . pay off in increased yields.

You'll probably find supplies of Ammonium Sulphate somewhat shorter this year so plan your needs well in advance. United States Steel Company, 525 William Penn Place, Pittsburgh 30, Pa.

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UNITED STATES STEEL

Poulsen To New Los Angeles Location

A. E. Poulsen & Co. has moved its plant and offices to a new location (pictured above) at 3306 East Slauson Ave. Los Angeles. The new plant provides five times the former production capacity, according to A. E. Poulsen, president of the company. The firm manufactures processing equipment for the insecticide, fertilizer, food, feed and seed industries.

The major factor in the expansion program according to Mr. Poulsen, is the increased sales activity in the firm's Uni-Blender division, which makes "ready-to-run" machinery for mixing, blending and packaging insecticides. Sales of this equipment have been made in many parts of the world, Mr. Poulsen reports.

NPA Appoints Hall

J. Newton Hall, vice-president in charge of sales and marketing, Julius Hyman and Company, has been appointed by the National Production Authority to serve on its Alkali-Chlorine Industry Advisory Committee. Mr. Hall will serve as a member of this Committee until April 1, 1952.

•

N. Central Weed Conference

Chemical weed control will be observed from many sides at the 1951 meeting of the North Central Conference scheduled to be held in Oklahoma City, Okla., December 9-13. Headquarters for the event will be the Biltmore Hotel.

Committee meetings will occupy most of the first two days, with the meeting proper opening Tuesday, Dec. 11. Chairman of this session will be Clyde Bower, with addresses by NCWCC president E. P. Sylwester and the mayor of Oklahoma City. L. M. Stahler is scheduled to talk on "Where do we Stand in Weed Control."

The afternoon program lists talks by Ernest Hart, immediate past-president of the National Agricultural Chemicals Association, Middleport, N. Y., and George Avery, director of the Brooklyn (N.Y.) Botanic Gardens. Sectional meetings are scheduled to be led by E. D. Anderson, Sig Bjerken, Ross Fleetwood, B. H. Grigsby, John Burke and S. W. McBirney. An evening session to discuss botany and plant physiology, is to be under the chairmanship of W. E. Loomis.

December 12 is to feature a general session with Harold Hutton chairman. On the program to discuss different specific weed pests, will be R. S. Dunham, George McCall and Neil Shafer. That afternoon L. M. Melander will be general chairman of a general session, concurrent with which will be a panel on brush control with H. L. Hanson as chairman. Clyde Spry will chairman a session on pasture weed control; D. L. Klingman, a session on "Stump the Weed Expert."

The annual banquet will be held December 12, with E. P. Sylwester as chairman. Howard Gramlich is listed as guest speaker.

Chairman and speakers for the final day include F. J. Greaney, C. J. Willard, Roy L. Lovvorn, H. E. Wood, W. M. McDonald, Andy Watson, and W. C.. Dutton.

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Kevorkian to New Post

The U. S. D. A. has announced the appointment of Dr. Arthur G. Kevorkian of the Office of Foreign Agricultural Relations as project director for the Cooperative Fiber Commission in Cuba. Dr. Kevorkian succeeds Joe E. Walker who has headed the fiber industry research project in Cuba since 1945, and resigned recently to enter private business.

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4th Bradley Generation

Peter B. Bradley has been appointed assistant managing director of Bradley Pulverizer Co., Allentown, Pa., according to an announcement by Wm. A. Gibson, managing director and vice-president.

Mr. Bradley takes his new position with a long family background of fertilizer enterprise, and also through his own experience. His grandfather, Peter B. Bradley and great-uncle, Robert S. Bradley, were the originators of the American Agricultural Chemical Co. His grandfather, Wm. L. Bradley, was one of the pioneer fertilizer manufacturers in the U. S., and his father, Wm. L. Bradley, is president of Bradley Pulverizer Co., a partner in the firm of Bradley & Baker, fertilizer brokers, and president of Bonneville, Ltd., potash producers.

The new appointee, 36, is a graduate of Princeton, and was a commissioned officer serving overseas in liaison operations during World War II.

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New Production Manager

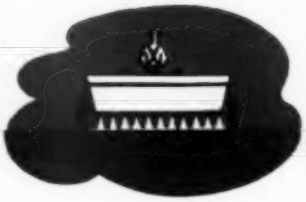
W. D. Holland has been named production manager of American Cyanamid Company's Agricultural Chemicals Division, the company has announced. He was formerly assistant to E. D. Powers, a vice-president and director of the company.

DAVISON

GRANULATED Superphosphate

3 WAY CONTROL

STORAGE CONTROL—No caking or lumping while in storage.



APPLICATION CONTROL—No dusting or bridging; drills free and even.

FOOD CONTROL—Supplies plant food at a uniform rate.

Now it is possible for you to store superphosphate without fear of its caking . . . that is, if it is DAVCO GRANULATED SUPERPHOSPHATE. DAVCO Granulated Superphosphate will not become hard or caked . . . it is easier to apply in the field because there is no dusting or bridging over in the drill.

DAVCO Granulated Superphosphate gives complete coverage in the field . . . drilling freely and evenly . . . supplying each plant with a uniform quantity of nutrient phosphorus.

Get DAVCO Granulated Superphosphate . . . the superphosphate that gives you the added sales points through its 3-way control.

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Washington Report

TWO decisions of importance to the insecticide trade have been announced by Washington agencies. These include the statement of the NPA's Benzene Hexachloride Industry Advisory Committee, that 125 million pounds of technical BHC will be needed next year, and further, that adequate facilities are available presently, to produce that amount.

The other matter is of specific importance to companies interested in exporting insecticides. The Office of International Trade has explained its current policy regarding exports of BHC and BHC-containing cotton dusts. Indications are that virtually all export needs will be filled so far as BHC technical and BHC formulations are concerned, although there had been some doubt about this in the past.

As a result of new production facilities brought into the picture during 1951, there was an actual production of 80,000,000 pounds of BHC made during the first six months of 1951. On that basis, the relative capacity with raw materials available, would be around 160,000,000 pounds of material based on 12 percent gamma average. Industry observers, however, have been inclined to regard the production estimates as being on the high side in view of the rather fair-sized inventories of finished cotton dusts left over from last season.

At the same time, a greater demand is expected for next season, and much of this demand will be for the higher gamma material since the U. S. Department of Agriculture has been recommending the higher gamma insecticide for the past few months. This is due in part to the odor factor of low-gamma BHC, but of more importance is the fact that the presence of other isomers tends to be toxic to the soil. Many in the BHC industry have expressed the opinion that 12 to 15% gamma BHC will become a thing of the past in years to come.

* * *

Exportation of BHC has been a matter of considerable concern to the trade for some months, since OIT had shown reluctance to allow shipments of formulations containing sulfur. With the strong demand for insecticides, particularly in South America, a good supply, and with U. S. Industry eager to export, many were irritated at not being able to ship. But OIT's newly-announced policy of allowing BHC, both in technical form and in formulations, to be exported, has cleared up the situation.

However, dusting powders requiring use of sulfur must have been available and packaged on or before August 15 in order to be eligible for export at this time. It is believed that this move was taken in order to aid industry in getting rid of its rather large inventory which would have hampered next season's plans. But because of the sulfur shortage, present policy apparently is that new allocations of sulfur will not be made for further export in mixtures with BHC. This move was regarded as being both wise and logical by many in the indutry, and the Washington officials responsible for its adoption were commended.

* * *

The tentative order setting proposed residue tolerances of agricultural chemicals to be permitted on fresh fruits and vegetables will not be issued this summer according to a recent prediction by the National Agricultural Chemicals Association. Lea S. Hitchner, secretary of the association, indicated that the tentative order is not expected earlier than late fall or winter.

* * *

Another example of American chemical industry's ingenuity is the manner in which the sulfur shortage is being attacked. It is indicated that there are 46 projects, including 24 of them in the U. S., now under way to produce sulfur in different forms from various sources. While other nations are instrumental in attacking this shortage, it is known that the efforts being made by U. S. companies will produce by far the greatest amount of sulfur to be derived from this new production. These 46 new projects will produce about 3 million long tons of sulfur by the end of 1953.

Among the projects in the U. S., there are 4 new brimstone mines and the expansion of an existing mine, with a total anticipated new production of 1,200,000 long tons. Other projects are expected to add 350,000 tons from natural gas, petroleum refinery gas, smelter gases and low-grade surface deposits.

* * *

The Department of Agriculture announced a new research division in the Bureau of Entomology & Plant Quarantine to be known as the Division of Stored Products Insect Investigations in which research will be conducted on the control of insects that destroy stored products. The acting leader of the new division will be Randall Latta who is a veteran Bureau researcher on various methods of insect control. (Complete details elsewhere in this issue).

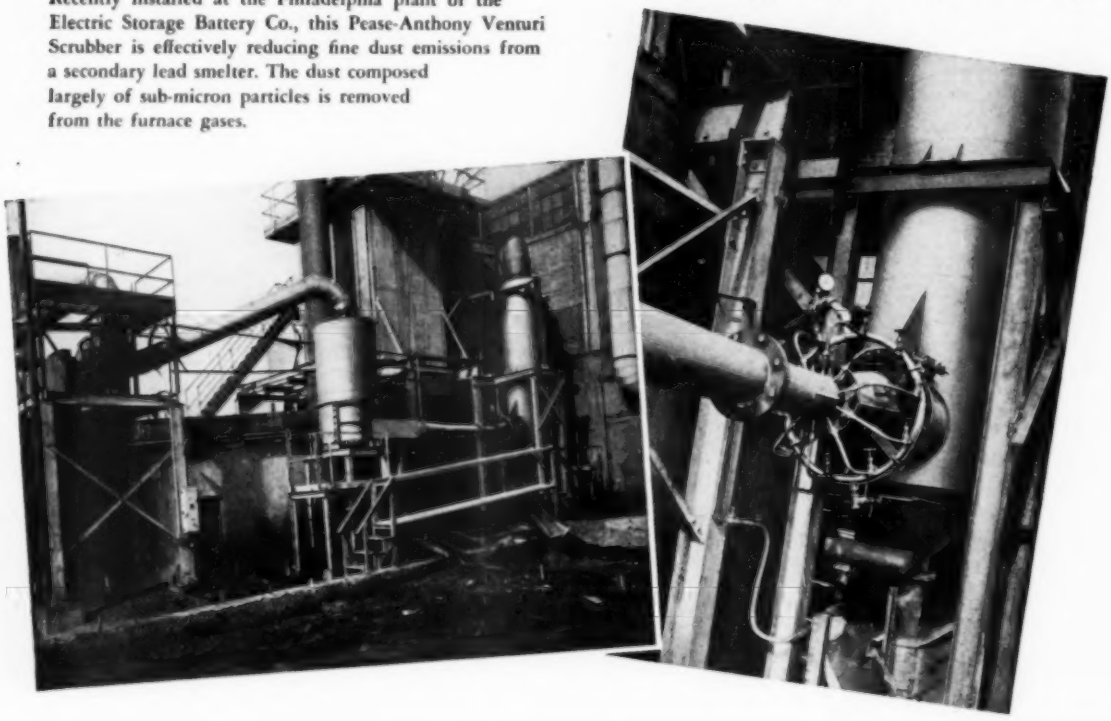
* * *

The agricultural insecticide industry at the present time is plagued with further shortages centering for the most part about metals. Lead required in the manufacture of lead arsenate and copper required in the manufacture of copper-containing fungicides are both on the critical list. Government agencies concerned with the production of agricultural pesticides are studying this problem of metal shortages quite intensively. Another problem is the scarcity of metal shipping containers. Although some help was secured for the agricultural pesticide industry last year, the shortage is expected to plague the industry during the fall and winter months. Sulfur, chlorine, and benzene are still in short supply and will continue to be a problem as long as the defense effort is under way.

(Turn to page 91)

Here's Efficient **DUST** and **FUME** Removal

Recently installed at the Philadelphia plant of the Electric Storage Battery Co., this Pease-Anthony Venturi Scrubber is effectively reducing fine dust emissions from a secondary lead smelter. The dust composed largely of sub-micron particles is removed from the furnace gases.



Other Typical Applications

Chemico P-A Venturi Scrubbers are now being used in a wide range of industries for the highly efficient removal of micron and sub-micron dusts and fumes. For a detailed analysis of your scrubbing problem, write or call our P-A Sales Department.

APPLICATION	MATERIALS BEING REMOVED	DUST AND FUME LOADINGS Inlet to Scrubber	Outlet from Scrubber
DUSTS			
Diatomaceous Earth Plant	Diatomaceous Earth	1.2 grains/scf	0.05 grains/scf
Rubber Blenders	Carbon Black	0.3 grains/scf	0.003 grains/scf
Yellow Brass Foundry Furnace	Zinc Oxide	3.5-10 grains/scf	0.7 grains/scf
Lime Kilns	Lime and Na_2O Fumes	7.0 grains/scf	0.02 grains/scf
Electric Furnace Fumes	Iron Oxide	0.2 grains/scf	0.03 grains/scf
Blast Furnace	Iron Oxide	4.0-20.0 grains/scf	0.008-0.08 grains/scf
Secondary Lead Blast Furnace	Lead and Rubber Compounds	1-10 grains/scf	0.05-0.20 grains/scf
FUMES			
Copperas Roasting Plant	H_2SO_4 Mist	100-300 Mg/scf	1-5 Mg/scf
Titanium Plant	H_2SO_4 Mist	120 Mg/scf	2.0 Mg/scf
Phosphoric Acid Plant	H_3PO_4 Mist	100-300 Mg/scf	3.0 Mg/scf
Wood Distillation	Tar Fog and Acetic Acid Mist	1000 Mg/scf	10-40 Mg/scf
Enamel Smelting Furnace	Dust and Fluoride Fumes	55.0 Mg/scf	4.0 Mg/scf
Dry Ice Plant	Amine Fog	25.0 Mg/scf	5.0 Mg/scf

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GB 934

Pennsalt Ups Whinfrey

The appointment of Charles G. Whinfrey, Jr., as sales supervisor of Pennsylvania Salt Manufacturing Company's Agricultural Chemicals Department has been announced by

CHARLES G. WHINFREY, JR.

Arthur F. Bixby, manager of sales.

Mr. Whinfrey will supervise the department's field sales-service representatives and direct the sales training and sales promotion activities of the department. He will also function as general marketing assistant to the manager of sales. He has been with Pennsalt since 1948 and prior to his new appointment was technical sales representative in New England and the northeastern territory. He is a graduate of Cornell University, and will make his headquarters at the company's Philadelphia office.

Two other appointments in the department have been announced also. Donald E. Hope will fill the position formerly held by Mr. Whinfrey, and John R. Keefer has just joined the organization as sales correspondent in the Philadelphia office.

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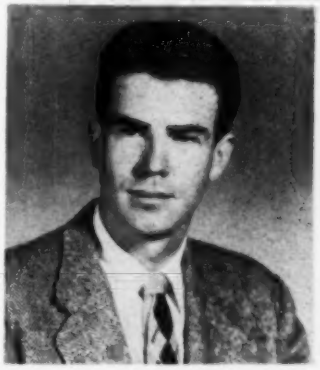
Furfural From Corn Cobs

The new Quaker Oats Co. furfural plant in Omaha, Neb., recently received its first shipment of corn cobs to be used in the production of furfural. The company expects to use about 200,000 tons of corn cobs a year when full operation is attained.

Gauntt Joins CSC Staff

Commercial Solvents Corp., New York, has announced the appointment of William A. Gauntt to its agricultural division. Mr. Gauntt, a graduate of Rutgers University



WM. A. GAUNTT

college of Agriculture, will make his headquarters in Binghamton, N. Y., and will handle the sale of the company's line of fertilizer and insecticides in the northeastern states.

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California Fertilizer Ass'n Program Announced

PROGRAM plans for the 28th annual convention of the California Fertilizer Association were practically complete as this issue went to press, according to Sidney H. Bierly, executive secretary and manager of the CFA. The convention is scheduled to be held November 1-3 at the Hotel Californian, Fresno, Calif.

Featured speakers on the program for Thursday, November 1, include Dr. Arnold E. Joyal, president of Fresno State College, who will discuss "The New Agricultural Look of Fresno State College;" Dr. Russell Coleman, president of the National Fertilizer Association, Washington, D. C., "Break the Bank;" James M. Quinn, Los Angeles, president of the California Fertilizer Association. "Past, Present and Future." The first day's program will also include a report of CFA activities by Mr. Bierly, and reports by industry leaders on the current fertilizer supply situation. The National Fertilizer Association's color movie, "Deeper Acres" will be shown that evening.

The topic of safety in fertilizer plants will be the subject of a talk by Harold R. Krueger, Phillips Chemical Co., Bartlesville, Okla., who will tell about the new Fertilizer Section of the National Safety Council scheduled to have met in Chicago on October 11. Allen B. Lemmon, chief of the California State Bureau of Chemistry, Sacramento, will be in charge of a program sponsored by his department to round out Friday morning's session.

The CFA's soil improvement committee, which carried out the association's research and educational program, will be featured in the afternoon session on November 2nd. This portion of the program will be in charge of M. E. McCollam, American Potash Institute, committee chairman. The annual banquet will be held that evening.

New Tex. Fertilizer Plant

A new chemical firm is reported to be in the making in Texas. To be called "Alamo Chemical Co.," the company's parent firms will be General Aniline & Film Co., Borden Co. and Phillips Chemical Co. Although details are lacking on the establishment of the firm, it is known that the Defense Production Authority has issued a certificate of necessity authorizing a tax write-off of 50% of $38,260,000, the amount involved in erection of a plant Alamo expects to build at Houston, near the present ammonium sulphate plant of Phillips Chemical Co. The new plant will make anhydrous ammonia.

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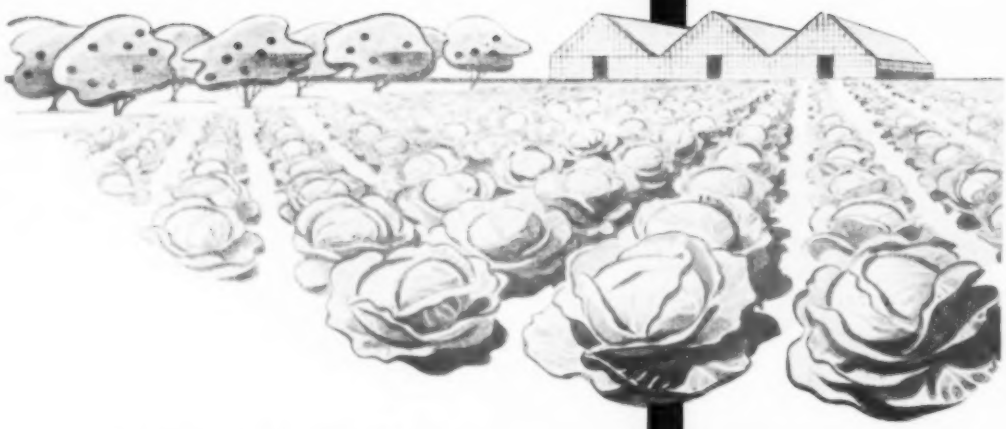
Glendon Rebuilds Plant

Glendon Pyrophyllite Co., Glendon, N.C., expects to have its new plant in operation around the first of the year, following a recent fire which leveled the former building. Equipment is being installed by Raymond Pulverizer Division.

Nifos-T vanquishes ...then vanishes



Properly formulated and correctly applied Monsanto Nifos-T (TEPP) destroys mites, aphids, thrips and dozens of other enemies of plant life. Since its toxicity rapidly disappears after it is applied, Nifos-T can be used safely on edible plants shortly before harvest.

Monsanto Nifos-T (tetraethyl pyrophosphate, technical) is manufactured for use on crops of the field, garden, greenhouse or orchard. Toxicity is such that it is not a chemical for use against pests in the household, in farm buildings or on animals.

While Nifos-T is one of the most toxic agricultural chemicals, reasonable precautions make it perfectly safe to handle. Nifos-T is economical whether used in formulations for sprays, aerosols or dusts. It is harmless to most plants when properly used.

Since chemical raw materials are short, Nifos-T may be hard-to-get during the months ahead. We suggest you establish your source of supply without delay. For information on Nifos-T, or other Monsanto insecticidal or herbicidal chemicals, contact the nearest Monsanto Sales Office or MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1700 South Second Street, St. Louis 4, Missouri.

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CHEMICALS – PLASTICS

SERVING INDUSTRY...WHICH SERVES MANKIND

MONSANTO HERBICIDAL CHEMICALS

2,4-D ACID
2,4-D SODIUM SALT
2,4-D ISOPROPYL ESTER
2,4,5-T ACID
2,4,5-T ISOPROPYL ESTER
SANTOBRITE® (Sodium Pentachlorophenate, Tech.)
SANTOPHEN® 20 (Pentachlorophenol, Tech.)

MONSANTO INSECTICIDAL CHEMICALS

ortho-DICHLOROBENZENE (Commercial Grade)
SANTOBANE® (DDT)
SANTOCHLOR® (para-Dichlorobenzene)
SANTOPHEN 20 (Pentachlorophenol, Tech.)
TRICHLOROBENZENE, Technical
NIFOS®-T (Tetraethyl Pyrophosphate, Tech. For agricultural use only)
NIRAN® (Parathion. For agricultural use only)

*Reg. U.S. Pat. Off.

AS WE GO TO PRESS . . .

Fertilizer Safety Conference, Chicago

REPRESENTATIVES of a wide segment of the fertilizer industry were expected to be present at the meeting of the Fertilizer Subsection of the Chemical Section of the National Safety Congress in Chicago, October 11. The meeting, set for 2 p.m. in the Stevens Hotel, was to inaugurate a new safety program in the industry which leaders hope will embrace the entire field in a short time.

The advance program called for opening remarks by general chairman A. B. Pettit, supervisor of Industrial Health and Safety for the Davison Chemical Corp., Baltimore, and a report of the nominating committee by H. R. Krueger, director, Technical Service, Phillips Chemical Co., Bartlesville, Okla. An election of officers was also on the agenda for the afternoon.

The following papers and discussions were also scheduled for the program: "Top Management's Safety Responsibility and the Benefits Derived from Safety Operations," by W. N. Watmough, Jr., vice-president of the mixed fertilizer division of Davison Chemical Corp. "Achieving Safety in Fertilizer Plants" is the title of a symposium led by J. M. Sisson, safety officer of the Tennessee Valley Authority. Participants of the symposium are listed as David P. Delavan, chemical superintendent, Pasadena Fertilizer Plant, Mathieson Chemical Corp., speaking on "Handling of Sulfuric Acid"; H. R. Krueger, "Handling Anhydrous Ammonia and Ammonia Solutions"; U. C. Ellis, general superintendent, Plant Food Division, Swift & Co., Chicago, "Handling Bulk Storage"; C. E. Killebrew, sales manager, The Frank G. Hough Co., "Operation of Mobile Equipment"; and M. F. Wharton, secretary-treasurer, Arizona Fertilizer, Inc., "The Importance of Good Housekeeping in Lowering Costs."

Also on the program is the showing of the sound film on fertilizer safety, "Henry's Ghost," sponsored by the Loss Prevention Department of Liberty Mutual Insurance Company.

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Carrigan Joins Armour

Dr. Richard A. Carrigan, biochemist and professor of soils at the University of Florida, has been appointed supervisor of the analytical chemistry section at Armour Research Foundation of Illinois Institute of Technology.

Dr. Carrigan has specialized in spectroscopy, chemical analysis, and agronomy. He has published a number of articles on trace elements in soils and their relationship to plant and animal nutrition. Dr. Carrigan received his bachelor's degree from the University of Florida in 1932 and his Ph.D. from Cornell.

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NPA Elects Hebbard

The National Production Authority, U. S. Department of Commerce, has announced the appointment of George M. Hebbard, Bay Ridge, Md., as Deputy Chief of the Inorganic and Agricultural Chemicals Branch of the Chemicals Division.

Mr. Hebbard is on leave as vice-president of operations and engineering of the Davison Chemical Corp. of Baltimore.

Sulfur Exports Hit at N. J. Meeting

DR. Russell Coleman, president, National Fertilizer Association, Washington, D. C., speaking before the New Jersey State Fertilizer Conference at New Brunswick, September 27, hit at government policies which allow "tremendous amounts" of sulfur to be exported while the American fertilizer industry faces cutbacks in production at this critical time, because of the lack of this element. The NFA head declared that to some leaders in Washington, the giving away of scarce and vital raw materials seems to be the most important matter on the economic agenda.

Dr. Coleman told the group of more than 200 fertilizer manufacturers and dealers that the demand for nitrogen is likely to be from 15 to 20% greater in 1952 than it was this past season, whereas there will be available some 5 to 8% more nitrogen. Thus, despite the increased output, a shortage is in the offing. The long term picture is favorable, however, with more plants being built for further production of nitrogen. The most critical shortage, he told the group, is in solid nitrogen products.

So far as potash is concerned, an increase of some 13% is expected, but the demand is expected to be up also. Spot shortages are likely for 1952, Dr. Coleman predicted, but there should not be an over-all lack of potash.

Superphosphate, however, will be short next year. Although an increase of some 7% in superphosphate production was attained during the first six months of 1951, this was accomplished by heavily depleting existing inventories. The trade may expect a decrease in 1952, of perhaps 15%, Dr. Coleman warned. The 7% increase noted the first half of this year is not a true picture of the situation, he declared.

Sulfuric acid itself is very short, with some companies being cut as much as 45%, while the average cut in the entire industry is about 20%. The NPA is drafting limitations on the use of both sulfur and sulfuric acid, extending perhaps down to the superphosphate level.

Tentative figures, not officially announced, indicate that the industry may be limited to 85 to 90% of the amount of sulfuric acid used in the calendar year of 1950. Such a limitation would affect seriously the production of superphosphate, he reminded, and added that if exports could be cut down, much of the pressure would be relieved. The U. S., with 90% of the world's supply of sulfur, is giving away or selling at nominal prices, a quarter of its output amounting to more than 1,300,000 tons a year.

Dean Wm. H. Martin, head of the Rutgers College of Agriculture welcomed the visiting fertilizer men, recalling some of the history of the event and commenting on its growth over the years since it started in 1936.

Carl B. Bender discussed the importance of intensive pasture management for better agriculture, and Joseph A. Chucka, Eastern States Farmers Exchange, presented a paper on "Physical and Chemical Problems in Mixed Fertilizer Production." He scanned the history of fertilizer manufacturing, emphasizing that the industry has long since outgrown its "scavenger" aspects, and has become a major part of the chemical industry. Plant food content has risen from some 12 units to about 23 units in a few years, and the trend is still upward. The importance of good physical condition of mixed fertilizers, and the difficulties encountered in attaining this end, was pointed out by Mr. Chucka. He reminded of the extremes in physical properties of materials used in fertilizer manufacture. Some materials are organic, others inorganic, he said. Some are coarse, others fine; some hygroscopic, others non-hygroscopic; and in addition, the complexity of combinations in mixed fertilizer has brought about problems of chemical reactions unknown heretofore.

Dr. Frank App described follow-up procedures in soil testing, and E. R. Purvis, also of Rutgers, talked on "What's New in Soil Research."

Hiller to New Position

Paul W. Hiller has been appointed New York district manager of chemical sales for the Potash Division of International Minerals & Chemical Corporation, according to an announcement by A. Norman Into, vice president of the corporation in charge of the division. Mr. Hiller's offices will be at 61 Broadway, New York City.

PAUL W. HILLER

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AAEE, APS, ESA Meet

A joint meeting of the American Phytopathological Society, the American Association of Economic Entomologists, the Entomological Society of America and the Potato Association of America is scheduled to be held at the Netherland Plaza Hotel, Cincinnati, Ohio, December 10, 11 and 12.

Program plans were being worked out late in September, and announcement of complete programs were expected to be available within a short time.

Officers of the APS are: president, Dr. James G. Horsfall, director, Connecticut Agricultural Experiment Station, New Haven; vice-president, George L. McNew, Boyce Thompson Institute, Yonkers, N. Y., and secretary; Dr. S. E. A. McCallan, Boyce Thompson Institute, Yonkers, N. Y.

A.A.E.E. officers are: president, Roy E. Campbell, Alhambra, California; first vice-president, Dr. Charles E. Palm, Cornell University, Ithaca, N. Y.; and secretary-treasurer, Ernest N. Cory, College Park, Md.

E.S.A. officers are: president, J. Chester Bradley, Ithaca, N. Y.; 1st vice-president, G. S. Ferrin, Stanford University, Palo Alto, Calif.; 2nd vice-president, H. A. Scullen, Corvallis, Oregon; and secretary-treasurer, Dr. Herbert H. Ross, Illinois State Biological Survey, Urbana, Ill.

Hercules Group in Toxaphene Meeting

Hercules Powder Co. group at the Westchester Country Club, Rye, N. Y., during the 4th annual Toxaphene conference, October 1-3. Presiding at different sessions were Fred Hogg, Frank Rapp and Richard Yates who led discussions on future plans for the organization. The meeting's theme centered around baseball, since the conference was being held at World Series time. Titles of talks were patterned after baseball terminology.

Chlordane Labeling Revised

Instructions to manufacturers to guide them in the labeling of household type chlordane insecticides under the Federal Insecticide, Fungicide, and Rodenticide Act are being revised, the U.S. Department of Agriculture has announced..

For insecticides, and the containers, packaging and labeling of such products prepared prior to September 15, 1951, the new instructions will be effective in one year. For insecticides, and the containers, packaging and labeling of such products prepared after September 15, 1951, the instructions will be effective immediately.

Sulfur Allocations

Allocations limiting the use of both sulfur and sulfuric acid in fertilizer were expected almost momentarily as this issue went to press. The office of Ralph S. Trigg, deputy administrator of the Defense Production Administration was to make the announcement before November 1st.

It was considered likely that NPA would also give priority ratings to synthetic organic fungicides and miticides to reduce the consumption of sulfur in these fields.

D. Dunford, Calif. Dies

Donald N. Dunford, sales manager of Inland Fertilizer Co., Los Angeles, Calif. and a member of the California Fertilizer Association. died of a heart attack on September 26 in Bakersfield, Calif. Mr. Dunford had been associated with the fertilizer industry in California for the past 25 years.

Ceiling on Potash

The Office of Price Stabilization recently announced ceiling prices on muriate of potash identical with the prevailing ceilings on most of the nation's production as established unner General Ceiling Price Regulations. Potash was covered by supplementary regulation 59 to GCPR and became effective September 15th. The ceiling prices are based on the shipping point and vary from 42 cents per unit (20 pounds) to 50½ cents.

Senate Committee Studies Chemicals

IMPORTANT testimony was given before the Senate Committee on Agriculture and Forestry which is conducting investigations on fertilizer and pesticide needs. (This committee is not to be confused with the Select House Committee of which Rep. James J. Delaney is chairman).

Witnesses included prominent persons in the fertilizer and pesticide field, including J. P. Margeson, executive vice-president, International Minerals & Chemical Corp., Chicago; Kenneth A. Spencer, president, Spencer Chemical Co., Kansas City; Paul T. Truitt, president, American Plant Food Council, Washington, D. C.; Dr. Russell Coleman, president, National Fertilizer Association, Washington, D. C.; Ralph S. Trigg, deputy administrator for Program and Requirements, D.P.A.; Kenneth Klipstein, chief Chemical Division, N.P.A.; Secretary of Agriculture Charles F. Brannan and Lea S. Hitchner, executive secretary and treasurer, National Agricultural Chemicals Association, Washington, D. C.

Mr. Margeson told the committee that at least 25% of the country's food production is due to use of commercial fertilizers, and that fertilizers make possible greater yields per acre with less labor. "Without commercial fertilizers, an estimated 50,000,000 more acres of land of average fertility and 1,500,000 additional farm workers would be required to grow our present crops. Total farm equipment has decreased from 11,700,000 in 1940 to 10,800,000 in 1949, while farm production has increased 27%." he said.

He pled for greater quantities of sulfuric acid to meet the needs of the fertilizer industry, on the basis of its being absolutely essential. "A survey of the problem shows that many of the superphosphate producers are receiving only 55 to 60% of the sulfuric acid which they received last year. In some cases, superphosphate manufacturers have been forced to close their plants for a lack of sulfuric acid."

Secretary Brannan declared that the keys to immediate, substantial increases in agricultural production are not solely in the hands of farmers who are eager to achieve greater yields. "These keys," said the secretary, "consist principally of additional amounts of fertilizers, chemicals and new machinery..." The U.S.D.A., he said, is attacking shortages on two fronts. First, it is promoting industrial developments needed to increase production of fertilizer materials. Second, it is promoting more efficient use of fertilizer. He told of the Department's recommendation for erection of greater facilities for production of nitrogen.

Mr. Spencer reviewed the activities of Spencer Chemical Co. in the manufacture of nitrogen, emphasizing the urgent need for materials to replace facilities taken over by the government. "If we are unable to replace the nitric acid units at Charlestown and are not able to secure the steel and other controlled materials essential to the construction of our Vicksburg works, then our production of nitrogen for agriculture will be approximately 54,000 tons short of our goal for the year commencing July 1, 1953. This is equivalent to approximately 160,000 tons of nitrogen solutions," he explained to the senators.

Because the tax bill was being debated in the Senate, the committee was obliged to recess. Witnesses scheduled to be heard were thus asked to file their statements with the Committee. These witnesses included Lea S. Hitchner, W. R. Allstetter, deputy director, Office of Materials and Facilities, PMA; Earl D. Anderson, secretary, National Sprayer and Duster Association, Chicago; and Kenneth H. Klipstein.

Washburn to New Position

Frank S. Washburn, member of the board of directors of American Cyanamid Company, and director of its Agricultural Chemicals Division, was elected president of the firm's Canadian subsidiary, North American Cyanamid, Limited, the company has announced. He succeeds Mr. H. P. Eastman, who retired August 31st. E. D. Powers, a vice-president and director of the parent company, was elected vice-president.

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Chemical Show Coming

More than 400 exhibits are to be on hand at the 23rd Exposition of Chemical Industries in Grand Central Palace, New York, November 26 to December 1, exposition officials have announced. A large proportion of the display will be given over to processing equipment and the materials employed, as well as suggestions for production short cuts to conserve critical materials.

Displays of tank and metal container linings will be seen at the Exposition, as well as new types of scientific instruments for research and production.

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Fire at Chem. of Colo.

The plant of Chemical Corporation of Colorado was damaged on August 27, by a flash fire. Production was halted but was rapidly getting back to normal at press time. M. H. Roseman, president of the Denver firm, said that damage was confined to sections involved with the manufacture of weed-killing chemicals. The fire causing damage estimated at $50,000 to $75,000, was thought to have resulted from a short circuit.

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Monsanto Ups Zorsch

Charles P. Zorsch Hamilton, Ill., has been named manager of the agricultural chemicals section of Monsanto Chemical Company's agricultural and special chemicals sales department at St. Louis.

Mr. Zorsch is a native of Rochester, N. Y.

EDITORIAL

(*Continued from page 30*)

more nutritious crops."

Blasting at the favorite theme of the cult, that insects and disease tend to ignore crops grown the "natural" way and concentrate on chemically-fertilized crops, the writer declares that no reputable scientist has yet reported any such observation. On the contrary, he told of authentic experiments made only this year, where results were exactly opposite to claims made by the cultists.

The indictment that mineral fertilizers destroy earthworms and beneficial soil bacteria is also refuted with a reference to the Rothamsted experiment station in Great Britain, where experiments have been going on for a hundred years. Here, after prolonged application of chemical fertilizers, it has been found that "earthworms are just as numerous in the soil of the fertilized plots as in the unfertilized — but those in the fertilized area are larger and fatter."

The article continues point by point to squash the "ridiculous dogma" of the cult which, in short, is based on nothing more than their unsupported claim that organic matter alone is the answer to better crops and improved nutrition. Also pointed out is the fact that "those who attack the use of fertilizers have little or no reason to use them, as they usually aren't making their living by farming. Many of them are folks who garden or farm for recreation."

To illustrate how utterly uninformed some members of the cult are, the author tells how some believe that the experiment stations are so heavily subsidized by the fertilizer industry that research workers are not free to tell the truth. And, as Mr. Throckmorton remarks, "nothing could be farther from the truth."

That such an article should appear in a publication of the stature of *Country Gentleman* is proof in itself that the organic cult's claims must be answered. The public needs to be told what is back of the ridiculous tenets of this anti-fertilizer group, and thus informed, we think the sensible people of the United States will grow increasingly suspicious of the fictitious claims of the organic farming fraternity.

IMC Shifts Keel, Linderman

S. T. Keel has been appointed domestic sales manager of the Phosphate Division of International Minerals & Chemical Corp., Chicago,

LINDERMAN KEEL

and R. H. Linderman, formerly northern district sales manager, has been transferred to Atlanta, Ga., as sales manager of the southern district, the company has announced.

Mr. Keel will also act as northern district sales manager, with headquarters in Chicago.

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NSTC Elects Wysong Pres.

The National Shade Tree Conference, meeting at the Netherland Plaza hotel, Cincinnati, Ohio August 27-31, elected as president, Noel B. Wysong, River Forest, Ill. to succeed E. W. Higgins, Arlington, Mass. Other officers named included L. C. Chadwick, Ohio State University, Columbus, secretary-treasurer; and Paul Tilford, Wooster, Ohio, was re-elected executive secretary of the Conference and editor of its publication, "Arborist's News."

Meeting with the N.S.T.C. was the Arborists' Association, which named the following officers at its meeting: president, Oscar F. Warner, Waterbury, Conn.; 1st vice-president, Sidney McNeal, Tiffin, Ohio; and 2nd vice-president, Gerald Corr, Houston, Texas.

Among papers presented at the meeting was one by F. L. Parr, Parr & Hanson, Hicksville, N. Y., "How I Operate a Small Tree and Landscape Business;" another by Dr. R. B. Neiswander, Dept. of Entomology, Ohio Agricultural Experiment Station, Wooster, "Some Shade Tree Insect Pests in the Midwest and their Control;" and a third by Dr. John G. Matthysse and Dan Clower, Dept. of Entomology, Cornell University, Ithaca, N. Y., "Factors Involved in Injury by Mist Blower DDT Formulations."

Other discussions covered physical aspects of tree care and pruning, a tree climbing contest and the election of officers. The annual banquet was held on the evening of August 30.

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New S Plant in Indiana

A plant expected to produce 55 tons a day of elemental sulfur is under construction by Standard Oil Co. at its Whiting, Ind., refinery. Most of the output will be converted to sulfuric acid. The new plant will extract hydrogen sulfide from by-product fuel gases produced in the refinery and this in turn will be converted into elemental sulfur of almost complete (99.9%) purity.

Barring a lack of construction materials, the plant is scheduled to be in production by the summer of 1952.

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Cotton Mechanization Meet

The fifth annual Beltwide Cotton Mechanization Conference will be held at Chickasha, Oklahoma, November 8 & 9, according to announcement by the National Cotton Council, Memphis, Tenn. The conference will discuss latest equipment for harvesting the bumper cotton crop by mechanical means, and numerous demonstrations are being planned as a part of the conference.

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Krings, St. Louis Speaker

Associated Drug & Chemical Industries of Missouri presented as guest speaker at the group's September 12 meeting, in St. Louis, R. E. Krings, director of advertising for Anheuser-Busch, Mr. Krings spoke on "Is There Magic in Television." The speaker has been in advertising since 1934, and with A-B since March, 1950.

Straube Upped by Powell

Harold L. Straube has been appointed operations manager of John Powell & Co., Inc., New York, according to H. Alvin Smith, presi-

H. L. STRAUBE

dent. Mr. Straube was formerly general manager of John Powell Chemical Co., Huntsville, Alabama, an affiliate company. He will now manage the operations of both the Huntsville and New York plants of the firm.

Morton E. Bader will be acting general manager of the Huntsville plant.

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Cyanamid opens L.A. Bldg.

American Cyanamid Company has announced the consolidation of several office and warehouse locations in Los Angeles, California, into one newly-constructed building at 2300 S. Eastern Avenue. Open house ceremonies marked the formal opening of the building on September 27th.

The move is the fourth of its kind undertaken by the company as part of a nation-wide program of consolidation in other major cities of the United States and Canada. The building is a 64,000 square foot, one story structure containing 44,000 square feet of warehouse space and 20,000 square feet of offices. It occupies a seven-acre site in the central manufacturing district sufficiently large to allow for possible future expansion.

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Industry Patents

2,553,778. PARASITICIDAL CONTAINING REACTION PRODUCTS OF MERCAPTO ACETIC ACID ESTERS AND PERCHLOROMETHYLMERCAPTAN. Patent issued May 22, 1951 to Roger S. Hawley, Linden, N. J., assignor to Standard Oil Development Company, a corporation of Delaware. As new chemicals, the reaction products of mercapto acetic and esters and perchloromethylmercaptan corresponding to the general formula:

$$Cl_3CSCH_2COOR$$

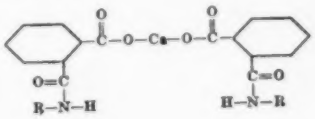
wherein R is an alkyl radical having from 2 to 12 carbon atoms.

2,553,905. CONCENTRATION OF PHOSPHATE MINERALS. Patent issued May 22, 1951 to Robert D. Evans, Pierce, Fla., assignor to American Agricultural Chemical Company, New York. In a method of concentrating phosphatic mineral in ore containing silica, the steps of preparing a silica-floating reagent by reacting in an aqueous medium a soluble salt of an amine having a composition containing 8 to 22 carbon atoms and characteristic of a silica-floating amine reagent, with a soluble reagent containing sulfate ion and adapted to convert said amine salt into an insoluble silica-floating amine reagent, consisting of an insoluble amine salt, to produce a diffuse, finely divided precipitate, of said insoluble amine salt, immediately introducing said precipitate while carried in said aqueous medium, into a pulp of the aforesaid ore, and immediately and without intermediate agitation subjecting the pulp to flotation operation in the presence of kerosene to separate a silica float, leaving a phosphate-enriched, non-floated portion of the pulp.

2,553,956. SEPARATION OF GAMMA BENZENE HEXACHLORIDE. Patent issued May 22, 1951 to Leslie James Burrage, Hunts Cross, and James Crosby Smart, Widnes, England, assignors to Imperial Chemical Industries, Limited, a corporation of Great Britain. A process for treating the total additive chlorination product of benzene to obtain therefrom a benzene hexachloride product having an enhanced proportion of gamma isomer which comprises extracting said isomer mixture with a cold lower saturated aliphatic monohydric alcohol having not over 2 carbon atoms in such amount as to dissolve only a part of said mixture and leave a substantial portion of said mixture undissolved, the weight of said alcohol being not less than half the weight of said isomer mixture.

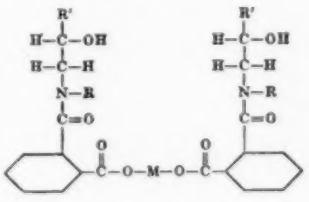
2,554,192. HERBICIDAL COMPOSITION. Patent issued May 22, 1951 to Clinton E. Byer, Puente, and Frank A. Menley, Lynwood, Calif., assignors to Socony-Vacuum Oil Company, Inc., New York, N. Y. A herbicidal spray composition comprising one part by volume of a liquid cracking product of petroleum characterized by gravity between 2° and 16° A.P.I. and mixed aniline cloud pointless than 100° F., one to six parts by volume of water, and a cationic surface-active agent in amount insufficient to stabilize the suspension of said oil in said water.

2,554,249. IMPROVED INSECTICIDAL COMPOSITIONS CONTAINING CALCIUM N-ALKYL PHTHALAMIDATES. Patent issued May 22, 1951 to Mark L. Hill, Yeadon, Troy L. Cantrell, Lansdowne, and Herschel G. Smith, Wallingford, Pennsylvania, assignors to Gulf Oil Corporation, Pittsburgh, Pa. An insecticidal composition comprising at least one insecticide toxicant selected from the group consisting of pyrethrins, halogenated hydrocarbon insecticide toxicants, organic thiocyano insecticide toxicants and mixtures thereof, a solvent therefor, and a substantially neutral calcium salt of a phthalamidic acid, said salt having the formula:



wherein R represents an alkyl group containing from 8 to 20 carbon atoms.

2,554,274. INSECTICIDAL COMPOSITIONS. Patent issued May 22, 1951 to Herschel G. Smith, Wallingford, Mark L. Hill, Boothwyn, and Troy L. Cantrell, Lansdowne, Pennylvania, assignors to Gulf Oil Corporation, Pittsburgh, Pa., An insecticidal composition comprising a pyrethrins insecticide toxicant, a toxicant selected from the group consisting of bis-2,2-dichlorodiphenyl-1,1,1 -trichloroethane, chlordane, gamma hexachloro cyclohexane, dichloro diphenyl dichloroethane, and bis - 2,2-difluorodiphenyl-1,1,1-trichloroethane, a solvent therefore, and a divalent metal salt of an N-alkyl, N-alkylol, ortho phthalamidic acid, said metal salt having the following formula:



wherein M is a divalent metal, R is an alkyl group containing from 8 to 22 carbon atoms and R′ is selected from the group consisting of hydrogen and alkyl.

Trade Mark Applications

URAMITE, in bold face capitals, for nitrogenous chemical compositions used for fertilizer ingredients. Filed July 15, 1949 by E. I. DuPont de Nemours and Company, Wilmington, Del. Claims use since April 20, 1949.

DROP DEAD, in capital outline letters with the word "dead" underneath and indented from the word "drop," for insect spray. Filed April 21, 1950 by Frank G. Marshall, doing business as Drop Dead Co., a fictitious name, Long Beach, Calif. Claims use since March 18, 1950.

LIN-DAIRY, in capital outline letters, for insecticide. Filed May 6, 1950 by Ralston Purina Company, St. Louis, Mo. Claims use since February 14, 1950.

CHEM-AG, in capital Goudy handtooled letters, for insecticides. Filed September 18, 1950 by Chem-Ag Corporation, San Francisco, Calif. Claims use since March 2, 1950.

DN-289, in capital script letters and numbers, for insecticides and fungicides. Filed August 5, 1950 by the Dow Chemical Company, Midland, Michigan. Claims use since February 12, 1947.

DOWKLOR, in capital bold face, for chemical composition used as insecticides and as ingredients for insecticides. Filed August 5, 1950 by the Dow Chemical Company, Midland, Michigan. Claims use since March 10, 1947.

BANARAT, in capital bold face letters, for rodenticides. Filed September 25, 1950 by American Scientific Laboratories, Inc., Madison, Wisconsin. Claims use since September 12, 1950.

ALIENTO, in bold face capital letters, for parasiticides - namely insecticides and fungicides; and herbicides. Filed September 30, 1950 by California Spray-Chemical Corporation, Wilmington, Delaware and Richmond California. Claims use since July 15, 1950.

GEM STATE, in capital bold face letters above a map of Idaho which indicates the location of the Snake River in the southern portion and in the south central part of the map on the Snake River is a black star with lines radiating from the points and the word "Wendell" in script to the left of the star, for fertilizers. Filed October 4, 1950 by Gates Bros., Inc., Wendell, Idaho. Claims use since April 1, 1948.

CSC Starts Expansion

Commercial Solvents Corporation has completed arrangements to borrow $25,000,000 from institutional lenders on 3¾% notes maturing September 1, 1972, the firm has announced. The proceeds will be used to finance the company's expansion program.

New projects being undertaken by the Corporation for which Certificates of Necessity have been received from the Government, amount to over $22,000,000. They include a new ammonium nitrate plant at Sterlington.

In addition, further expansions to increase the output of other chemicals, drugs and agricultural products are under consideration.

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Spencer Reports Gains

Spencer Chemical Co., Kansas City, has reported an increase of 22.4% in net sales for the fiscal year ended June 30, 1951. Net earnings for the period were $4,562,064 (after taxes) as compared with $4,461,312 during the previous year. State and federal taxes totaled $4,162,400 as compared to $2,790,100 the previous period, according to Kenneth A. Spencer, president of the company.

•

Safety Award to Bemis

The St. Louis bag manufacturing plant of Bemis Bro. Bag Co. recently was awarded first prize in the Interplant Safety Contest sponsored by the Safety Council of Greater St. Louis.

The prize was in recognition of maintaining the lowest number of employee accidents per million man hours worked. The Bemis plant had an average yearly employment of 552 persons who worked approximately one million man hours. The accident frequency rate for this period was 4.00, while that of the entire 83 participating plants, working 100 million man hours was 13.27.

•

Baerman Appointed by Naco

Gerald D. Baerman has been named director of all insecticide activities of Naco Fertilizer Company, according to an announcement made by Kenneth D. Morrison, president. Mr. Baerman was previously associated with Shell Chemical Corporation in its Agricultural Products Department. Naco Fertilizer Company operates insecticide plants at Charleston, South Carolina; Wilmington, North Carolina; Jacksonville and Ft. Pierce, Florida, and Findlay, Ohio.

•

Oldham New Plant Mgr.

Dr. W. N. Oldham has been appointed manager of American Cyanamid Company's Azusa, California, plant, the firm has announced. Dr. Oldham joined the company in 1939, and began work at Azusa as chief chemist in 1945. He has been assistant plant manager since 1950.

Products manufactured by Cyanamid's Azusa plant include hydrocyanic acid for fumigation, and monosodium cyanamid for cotton dusting.

WETTABLE POWDER INSECTICIDE SUSPENSIONS

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THE MORE EFFECTIVE
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Stable dispersions of DDT, BHC, Sulfur . . . in fact any insecticide formulated as a wettable powder . . . are easily obtained by the addition of one to two percent Marasperse. With Marasperse added, spray tank contents are maintained at a uniform concentration. Insecticides are uniformly applied for maximum effectiveness throughout the spraying period.

Because it is a non-hygroscopic and free-flowing powder, Marasperse facilitates grinding and blending operations. It can be stored indefinitely without caking or deteriorating.

The powerful dispersing action of Marasperse is unaffected by the hardest waters. Marasperse enhances the action of wetting agents and permits the use of reduced amounts of these high cost components in formulations. A neutral compound, Marasperse will not affect toxicity of the insecticide.

Write for samples and additional information on Marasperse. Our technical staff will welcome the opportunity to cooperate with you.

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Ag. Editors Entertained in Washington

Pointing out that although fertilizer production and use in the United States has doubled in the past eight years, W. A. Minor, Assistant to the Secretary of Agriculture, told the National Agricultural Editors Association in Washington September 10, that there must be greatly increased production of fertilizer materials if agricultural yields are to keep pace with demand. He declared that the need now is for sustained high-level production and at the same time to maintain soil fertility levels.

The use of fertilizer to attain greater production is of particular importance, since greater crop yields are obtained with less expenditure of both manpower and machinery when fertilizer is relied upon to do the job. The past year was the thirteenth consecutive period when fertilizer consumption had exceeded the figures of the previous year. But although the trend is upward, it still is not sufficient for the long-term need, he warned.

In the photos:

Upper picture, at National Fertilizer Association's open house, September 10. (L to R): Milon Grinnell, "Michigan Farmer;" John M. Collins, "Weekly Kansas City Star;" Ferdie Deering, "Farmer-Stockman;" Jack Sampier, "National Livestock Producer;" Berry Akers, "The Farmer;" Ray Yarnell, "Cappers' Farmer."

Lower photo: C. L. "Cap" Mast, "Agricultural Leaders' Digest," Paul T. Truitt, president, American Plant Food Council, and editor Deering at Hotel Carlton luncheon. Event was sponsored by American Plant Food Council.

Looking ahead, Mr. Minor said that the need for plant food may exceed 10 million tons by 1960, if present rates of increase are continued. When compared with the approximately 4½ million tons consumed during the past year, this figure takes on great significance, he said.

At the same luncheon meeting, sponsored by the American Plant Food Council, at the Carlton Hotel, Paul T. Truitt, APFC president, told the assembled editors that the farmer must be better informed about what the fertilizer industry is doing to increase needed plant food materials. He called splendid the record of achievement made by the fertilizer industry in the past and added that this type of progress will continue to be made in the future.

Monday evening, September 10, the editors were invited to an open house at the offices of the National Fertilizer Association in the Investment building in Washington. The group also visited various Department of Agriculture offices, and toured the Bureau of Plant Industry station at Beltsville, Md.

•

Chapman P.C.B. Distributor

Pacific Coast Borax Company, Los Angeles, California, has announced the appointment of the Chapman Chemical Company, Memphis, Tennessee, as a distributor of their weed and grass killing products, "Borascu" and "Polybor-Chlorate 88." Distribution arrangements with Pacific Coast Borax Company cover all parts of the United States except the Pacific Northwest.

Chapman Chemical Company, long a supplier of chemicals for wood preservation, is also one of the leading manufacturers and suppliers of agricultural insecticides throughout the southern states. In addition to Chapman's headquarters at Memphis, Tennessee, representatives are located at Houston, Texas; Jackson, Mississippi; Montgomery, Alabama; Jacksonville, Florida; Charlotte, North Carolina; Norwalk, Connecticut; Minneapolis, Minnesota; Chicago, Illinois; Spokane, Washington and Portland, Oregon.

•

Lion Names PR Director

Lion Oil Co., El Dorado, Arkansas, has announced the appointment of John H. Gray as Director of Public Relations. Mr. Gray is a native of Newark, N. J. and a graduate of Cornell University.

are your insecticides BLENDED or just mixed?

The Spatula Test will tell

Conventional mixing seldom produces fine powder blends of high uniformity. Telltale lumps, nodules, and streaks under the spatula test betray inadequately mixed formulas. Imperfectly blended agricultural dusts mean incomplete coverage, low field efficiency, complaints and lost business.

Sprout-Waldron's *Intimate Blending Systems* are replacing old-fashioned mixers in insecticide plants all over the country. Engineered to individual needs, they have an unrivaled record of efficiency and safety in a great variety of installations. Low-cost, dust-free operation—producing formulas of the highest uniformity have made Sprout-Waldron's *Intimate Blending Systems* a byword wherever insecticide and fungicide dust blends are made and used.

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Manufacturing Engineers
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Hyman Receives Award

A certificate of cooperation has been presented to Julius Hyman and Company by the Economic Cooperation Administration as a special recognition for their part in assisting the technical visitors from the Western European countries to gain a better understanding of the United States economy and business methods.

In forwarding the certificate, William C. Foster, Administrator of the Economic Cooperation Administration, said in part:

> "I wish you would convey to the members of your organization the gratitude which all of us in ECA feel for the splendid way in which they cooperated to make the Technical Assistance Program a success, and in so doing helped in the united effort of the Western World to strengthen its defenses."

•

Add 4 to Pennsalt Staff

The addition of four new technical sales representatives to Pennsylvania Salt Manufacturing Company's Agricultural Chemicals Department has been announced by Arthur F. Bixby, manager of sales.

Two of the new men will make their headquarters at Montgomery, Ala. They are William T. Debusk and O. Harry Blanton. Mr. Debusk, a graduate of Auburn College, has been assigned to the Tennessee territory, and Mr. Blanton has been assigned to North and South Carolina. He is a graduate of Clemson College and comes to Pennsalt from the Virginia-Carolina Chemical Corp.

James E. Murray has been assigned to the midwest territory and will headquarter at Kansas City. He is a native of Washington, D. C., and a recent graduate of the University of Maryland, where he majored in entomology.

F. O. Swan, Jr., has been assigned to the Texas territory with headquarters in Bryan.

AGRONOMISTS

(Continued from page 48)

utilized in the manufacture of fertilizer.

To complete the morning pro-

gram, J. C. Sharp, Spencer Chemical Co., Kansas City, Mo., presented a technical paper on "Chemistry and Technology of Ammoniated Superphosphate." Mr. Sharp's paper correlated a number of theoretical concepts of fertilizer technology and offered suggestions on how they might be translated into better products at lower cost. The paper covered chemical reactions, ammoniating solutions, mixed fertilizer containing dolomite; influence of temperature and moisture, optimum plant operations, formulation, and costs.

The afternoon session was in charge of W. L. Nelson, North Carolina Agricultural Experiment Station, Raleigh. Discussing the sulfur situation, the first speaker, G. W. Josephson, U.S. Bureau of Mines, showed a Department of Interior movie of sulphur production, and stated that the current situation is a little clouded due to lack of accurate figures on reserves on hand at the present time.

W. L. Hill, Bureau of Plant Industry, Soils and Agricultural Engineering, U.S.D.A., presented a technical paper, plus slides, plus a blackboard presentation of various formulas, in a discussion of "Particle Size—Plant Nutrient Relationships in Phosphate Fertilizers." Mr. Hill told of experiments made to determine the solubility of various sized fertilizer particles, including granules, and discussed the mathematical equations arrived at in the process.

Final speaker on the day's program was Ritchie Taylor, Davison Chemical Corp., Baltimore, Md., who spoke on the physical condition of mixed fertilizers.

Meeting Continues

THE agronomists and soil scientists continued their meeting throughout the remainder of the week, terminating on August 31st. Their program included special tours around the Penn State campus, the presentation of technical papers and various committee meetings.

On August 31 a section on weed control was held under the chairmanship of W. B. Ennis, Jr., Mississippi Agricultural Experiment Station. The program for this section was as follows:

"Chemical Weed Control in Tobacco Plant Beds," G. D. Hill, G. C. Klingman, and W. G. Woltz, North Carolina Agricultural Experiment Station. "Some Fundamental Aspects of a Weed Control Program," I. J. Johnson, Iowa Agricultural Experiment Station. "Sodium Trichloroacetate for Johnson Grass Control," Robert A. Peters and C. J. Willard, Ohio State University and Ohio Agricultural Experiment Station. "Absorption of 2,4-D by Corn and Pea Seeds," J. R. Hansen and K. P. Buchholtz, University of Wisconsin. "Studies on the Influence of Droplet Size Upon the Inhibitory Effectiveness of Growth-Regulating Sprays," W. B. Ennis, Jr., and Ralph E. Williamson, Camp Detrick, Frederick, Md.

"Responses of Corn to 2,4-D," Earl G. Rodgers, Iowa Agricultural Experiment Station. "The Reaction of Different Hybrids to Post-emergence Applications of 2,4-D," J. C. Anderson, New Jersey Agricultural Experiment Station. "Effects of 2,4-D in Bluegrass and Clinton Oats Grown Under Different Fertility Levels," Richard J. Aldrich, U. S. Department of Agriculture, and R. E. Engel, New Jersey Agricultural Experiment Station. "Equipment and Methods Used in Evaluating Chemicals for their Herbicidal Value," W. C. Shaw and C. B. Swanson, U. S. Department of Agriculture, Beltsville, Md., and "Quackgrass Control," S. M. Raleigh, Pennsylvania State College.

NAC MEETING

(*Continued from page 36*)

Dr. Firman E. Bear, Rutgers University, New Brunswick, N. J., presented to the group a thoughtful paper dealing with the depletion of soil fertility throughout the United States, and pointing out how crop yields are no longer sufficient when allowed to grow unaided by added soil nutrients. He stressed the importance of minor elements in the soil, pointing out that as the soil grows older agriculturally and as the yields are stepped up deficiencies develop. Different areas need various elements in addition to NKP, he said. Some need iron, others magnesium, still others boron, molybdenum,, copper, zinc, cobalt or iodine to round out sufficient and balanced plant nutrition.

He said that the soil of the United States can support food "in abundance" for a population of a billion people, but diets at that point will be altered somewhat with less meat, and more bread, potatoes and vegetables.

Jack Vernon, vice-president of Niagara Chemical Div., Food Machinery Corp., Middleport, N. Y., discussed the importance of cooperation between agricultural chemical manufacturers and the makers of application machinery, to maintain maximum efficiency from each. He reviewed the progress made along this line during the past five years and brought the Association members up to date on the continuing cooperative efforts under way.

Dr. H. E. Longenecker, Dean of the Graduate School, University of Pittsburgh, and chairman of the Food Protection Committee of the National Research Council, told about the formation of the committee and its functions. Since the relationship of agricultural chemicals to the national welfare has received such publicity, both good and bad, the committee expects to establish facts in the matter and to make constructive recommendations to both government and industry.

The food protection committee will operate with specific subcommittees and a liaison panel of consultants representing contributing idustries, trade associations and foundations, government agencies and of scientific and technical societies.

Chairman of the subcommittees considering specific problems are as follows: Pesticides—Dr. G. C. Decker, Head, Economic Entomology Section, State Natural History Survey and Illinois Agricultural Experiment Station, Urbana, Illinois; Toxicology—Dr. E. A. Maynard, Assistant Professor of Pharmacology and Toxicology, School of Medicine and Dentistry, University of Rochester; Chemistry—Dr. D. E. H. Frear, Professor of Agricultural and Biological Chemistry, Pennsylvania State College; Food Technology—D. B. Hand, Professor and Head, Division of Food Science and Technology, New York State Agricultural Experiment Station.

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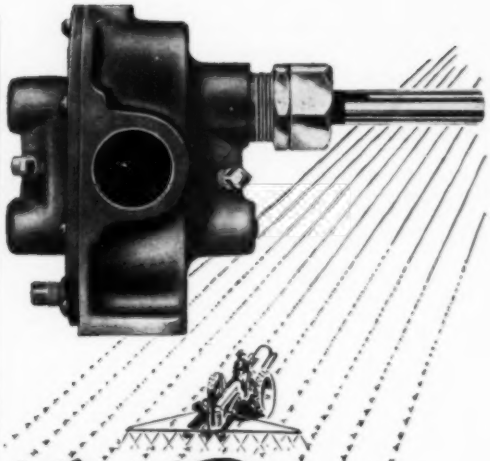

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Dept. AC-5110, Agricultural Pump Div.
Oberdorfer Foundries Inc., Syracuse, N. Y.

OBERDORFER BRONZE SPRAYING PUMPS

WASHINGTON

(*Continued from Page 79*)

A transfer of certain chemicals including sulphur from Manufacturers' General Ceiling Price Regulations (CPR 22) to the General Ceiling Price Regulation was recently announced by the Office of Price Stabilization. The transfer was accomplished by transferring their control from CPR 22 to the GCPR by adding them to the excepted products listed in appendix A of CPR 22.

Sulphur was included because, mined in its natural form, it is included under GCPR, while sulfur obtained by chemical means such as refinery gases and such is controlled under CPR 22. The new ruling places all sulfur under one regulation subject to the same regulation regardless of the source.

•

The problem of excess supply again has returned to plague the cotton growing industry. It was only last fall that the Department of Agriculture and other Federal agencies were spearheading a drive to expand appreciably the production of cotton. Now we are again faced with a possible over-supply.

With the exception of last season when cotton was in short supply because of huge demands and poor yield in 1950, for 30 years the problem of cotton has been confined almost entirely to handling excess production. It is believed that the Federal government may have to advance upwards of one billion dollars for price support and other large sums through the various foreign aid programs to stimulate sale of the staple abroad. The Department of Agriculture estimated in September that the 1951 yield would be 17,291,000 bales of 500 lbs. each. The price of the staple has been declining steadily since July 1st and from a price of 45.25¢ lb. on June 28th, the price in the latter part of September declined to an average of 34.33¢ at the ten spot markets in the south.

The drop of almost 11¢ lb. in the past 2½ months, sharpest for any similar period since 1920, has brought cotton to within 2½¢ lb. of the average loan rate of 31.71¢ at the 10 spot markets. To keep prices from dropping to the loan level, farmers are being encouraged to place their cotton in the loan. Secretary Brannan has expressed the opinion that better than 5 million bales from this year's crop will be placed in the loan or roughly 30% of the anticipated crop.

No doubt this large supply of cotton held over this year will have its effect on the amount of insecticides that are likely to be used during the 1951-52 season. However, the Department of Agriculture, the National Production Authority and other government agencies are making sure that there will be a minimum amount of insecticidal materials available to assure protection of the crop which is planted in the 1951-52 season. No doubt the large carry-over of finished cotton insecticides existing in various spots throughout the south will be very carefully considered by the industry in making plans for the coming season.

* * *

The Office of Materials and Facilities of the Production & Marketing Administration of the Department of Agriculture is to be congratulated for its foresight in its efforts for the conservation of sulfur for pesticidal use. During the latter part of the summer, it started a campaign to bring about conservation of this critically short chemical in its use during the summer and fall and also in anticipation of an even greater shortage in the 1951-52 season. In cooperation with other agen-

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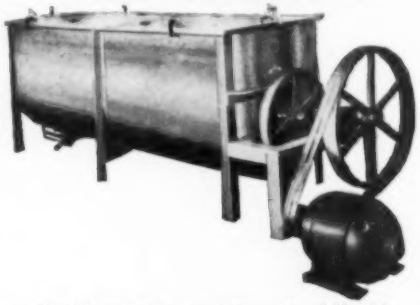

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cies within the Department as well as other Federal groups, efforts have already been undertaken to further conservation efforts in the 1951-52 season. An estimate has been made that there will be 20-25 % less sulfur available in 1952 than in 1951 for dusting sulfur and other pesticidal use, and every effort has been made to bring this shortage to the attention of various state and local groups throughout the country.

Recommendations for the use of substitute miticides have also been brought to the attention of these groups and recommendations for cotton insecticide use for the coming season will undoubtedly stress the conservation of sulfur and the necessity of not using sulfur as a diluent.

Agriculture is the largest single consumer of sulfur and it is emphasized even more when realized that 35% of the sulfur consumed in the U. S. goes into fertilizers in the form of sulfuric acid. There are, of course, substantial additional amounts of sulfur used in other agricultural endeavors including dusting sulfur, soil sulfur and for the manufacture of many of the technical pesticidal chemicals.★★

ACS MEETING

(Continued from Page 57)

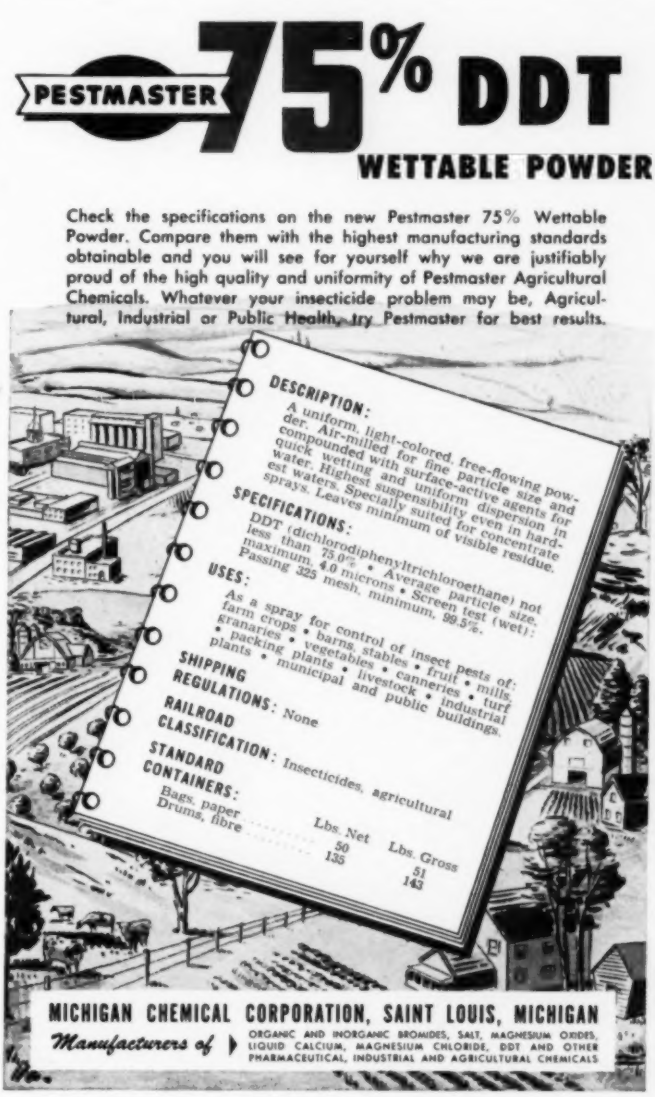
authoritative information on plant disease losses for the use of governments, pesticide manufacturers, and others needing such information.

Information gained and disseminated through such efforts can only lead to more economical and effective use of pesticide research and action personnel, and of pesticide manufacturing, sale, and distributing facilities. This, in turn, should result in a more productive agriculture at a time when agricultural products are so vital to international tranquillity.

Significant papers were also presented at the 12th International Congress of Pure and Applied Chemistry, held in New York immediately following the ACS meeting. A paper reporting the effect of feeding rats tissues from sheep and butterfat from cows which had consumed DDT-dusted alfalfa hay was presented by D. A. Greenwood, Logan, Utah. The paper reported that the rats, whose diets included milk and meat products from animals fed DDT-dusted alfalfa hay, suffered no alteration of growth or tissue development as a result of inclusion of the insecticide in their diets.

Dr. Greenwood, described the experiment as follows:

"Alfalfa was dusted with technical DDT for the control of insects at following levels: No DDT, 0.5, 1, 2, and 4 pounds an acre," he said. "One to 2 pounds of technical DDT is the amount usually employed in Utah for controlling insects in alfalfa hay production. The yield of alfalfa on plots treated with 1 to 4 pounds of DDT an acre was about 30 per cent greater than on untreated plots. The carotene con-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DDT (dichlorodiphenyltrichloroethane) not less than 75.0%. • Average particle size, maximum, 4.0 microns • Screen test (wet): Passing 325 mesh, minimum, 99.5%.
USES:
As a spray for control of insect pests of: farm crops • barns, stables • fruit • mills • granaries • vegetables • canneries • turf • packing plants • livestock • industrial plants • municipal and public buildings.
SHIPPING REGULATIONS: None
RAILROAD CLASSIFICATION: Insecticides, agricultural
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tent of DDT-dusted alfalfa was also significantly higher..

"Hay treated with 0.5, 1, 2, and 4 pounds of DDT an acre was harvested and fed to 32 lambs for 120 days, and to 16 dairy cows for 113 days. An additional 32 lambs were force-fed DDT in capsules in amounts corresponding to those found in hay containing 50, 100, and 200 parts a million of DDT.

The lambs grew at normal rates and appeared healthy throughout the feeding period. Following slaughter of the sheep, kidney and mesenteric fat (contained from 15 to 74 parts a million DDT) were incorporated into experimental diets for rats and feed for 16 weeks. Sheep leg (contained a maximum of 1.5 parts a million DDT) was incorporated into the diet and fed for 12 weeks. All rats grew normally and appeared healthy during the period.

Milk was obtained from cows that consumed DDT-dusted hay. A maximum percentage of 12 parts a million DDT was present in the milk of these cows. The milk was separated, the cream churned, and the butter added to an experimental rat diet. The diet was fed for 16 weeks, after which the rats were killed.

"Growth, gross and histo-pathological studies were made on the liver and kidney tissues of each rat. A total of 231 rats were studied.

"There was no significant difference in food consumption, rate of growth, or tissue changes that could be detected by gross and microscopic examination in the rats fed the highest and lowest levels of DDT. High concentrations of DDT in the diet of rats gave the greatest storage of it in their body fat.

"DDT-dusted alfalfa hay in amounts required to give insect control, when fed to young sheep and cows caused no injury to the animals. The subsequent feeding of lamb tissues and butterfat to rats did not alter the growth or tissues of the rats under the conditions of these experiments."

Co-authors of the report were L. E. Harris, Clyde Biddulph, Wayne Binns, M. L. Miner, L. I. Madsen, J. R. Harris and F. L. Mangelson.

Dr. Joseph M. Ginsburg, Rutgers University, New Brunswick, N. J. declared that DDT is still the most effective means for control of mosquitoes. "Of all the newer insecticides tested, none compares with DDT in its remarkable combined properties of high toxicity to mosquitoes; long residual effectiveness, and relatively low toxicity to plants and higher animals."

The limiting factors in most of the new insecticides appear to be their injurious effects on fish and higher animals and their tendency to decompose upon exposure to atmospheric conditions for some time.

Perhaps the greatest benefit to mankind derived from the use of DDT is "the possibility of almost completely eliminating malarial mosquitoes," he said, and added, "Many endemic malarious areas throughout the world have been practically

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freed from this disease by continuous application of DDT as residual house sprays and field treatments."

MORE NITROGEN

(*Continued from Page 45*)

Estimated Distribution of Fertilizer Nitrogen for 1950-51 by Materials and Desirable Distribution of Currently Scheduled Expansion of 700,000 Tons Fertilizer Nitrogen (1,000 Tons of N.)

Material	1950-51	Desirable Distribution of 700,000 Ton N Expansion	Total
Ammonium Nitrate	284	150	434
Ammonium Sulphate	287	90	377
Ammonia and Nitrogen Solutions	455	140	595
Sodium Nitrate (Dom. & Imp.)	135		135
Urea Compounds	22	130	152
Nitrophosphates	1	150	151
Ammonium Phosphates	41	40	81
Other Chemicals	19		19
Organics	41		41
Total	1,285	700	1,985

The supply of solid materials in recent years has been inadequate. Farmers should be able to buy nitrogen for direct application as and when required and fertilizer mixers should be able to obtain materials which can be used for production of high nitrogen content mixed fertilizers to meet growing demand and need for such fertilizer. Also, fertilizers containing large relative quantities of plant food are becoming more and more important in view of increasing transportation and handling costs.★★

•

Fall Seminar Announced

The remaining lectures of the Fall Seminar Program at Boyce Thompson Institute, Yonkers, N. Y., have been announced. On October 17, Harry L. Haynes will discuss "Evaluation of Household Insecticides by Different Methods." October 24, "Synergism between Rotenone and Piperonyl Compounds," by Richard Back. October 31, "The Fumigant Action of the Halogenated Hydrocarbons in Grains," by Roy Melvin.

The November 7 program will feature "Amino Acid Nutrition of German Cockroach under Aseptic Conditions," by Duncan Hilchey. November 14, "The Inherited Resistance of Houseflies to DDT and other Insecticides," by Robert Norton. November 21, "Possible Mechanism of Action of 2,4-D," by Robert Carroll. November 28, "Nutritional Requirements of Fungi causing Tree Anthracnose Diseases," by Paul Schuldt.

Only two lectures are scheduled thus far in December. They are: Dec. 5, "The Prevention of Storage Rots of Vegetables," Ralph Aulthaus; and December 19, "The Effect of Fungicides on Amylase Activity," by Robert G. Owens.

Dr. S. E. A. McCallan will preside. Lectures are held in the auditorium at 4 p.m. following tea in the library at 3:45.

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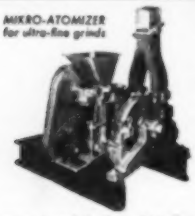

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Flag Sulphur & Chemical Co., Tampa, Fla., has announced the opening of its new office at 72nd. Street and the A.C.L. Railroad. Mail is to be addressed to P. O. Box 5737, and the new telephone number is 4-2177.

•

To New Nitric Acid Plant

Neil C. Elphick has been appointed resident manager of the $2,200,000 nitric acid plant being constructed by Westvaco Chemical Division of Food Machinery and Chemical Corporation for the U. S. Government at the Sunflower Ordnance Depot, Kansas.

Mr. Elphick has been assistant manager of the Westvaco Division's Carteret, N. J. plant since June, 1950, after serving as a production specialist in the New York office. He joined Westvaco in 1941 after graduating from Clemson College.

FUNGICIDES

(*Continued from page 65*)

ably less hazardous than sodium arsenite.

"Phygon XL" for P. B. Blight

DWIGHT Powell, of the University of Illinois, states that studies for the past several years have emphasized the importance of blossom blight control on peaches in reducing incidence of brown rot at harvest. Because of the erratic nature of blossom blight infections it has been difficult to secure significant data in Illinois. In 1949 and 1950 different orchards were given identical treatments with the hope of securing at least one orchard which would have sufficient infection for a comparative test. It is felt that the following data de-emphasize the importance of the pink bud application, emphasize the efficacy of "Phygon XL" in preventing blossom blight infections, and stress the importance of blossom blight control in reducing preharvest incidence in Illinois.

In 1949, single tree plots of the Red Bird variety were arranged at random with eight replications per treatment. On April 1, in the pink bud stage, the grower applied liquid lime sulfur 1 gallon, plus sulfur paste 4 pounds, to 100 gallons of water. On April 5, in the early bloom period, the treatments listed in Table 2 were applied. On April 29, 100 blossoms were selected at random from each tree and the number of infected blossoms recorded. Only those blossoms showing conidia were considered infected. Laboratory isolations have shown, however, that 10 to 25 percent of the so-called weak blossoms (those which fall normally and do not set fruit) are infected but do not develop conidia.

In 1950, a 15-acre block of Elberta was divided into three equal plots and on April 18, in the early to full bloom period, was given the

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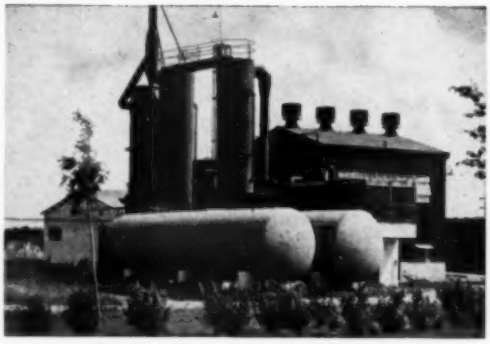

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treatments listed in Table 3. The check plot received no treatment during the entire season and consequently had lost all of its fruit by July 20. The other two plots received the same treatment for insect control after the blossom application. On May 12, the mean blossom infection was recorded by examining 100 blossoms from each of eight trees per plot. Only those blossoms showing conidia were considered infected. Also, on May 12, the number of active blight cankers to 100 twigs of each of the same eight trees per treatment were recorded. On July 24, August 8, and August 14, the same trees were examined for fruit infections by observing 100 fruits per tree.

In Table 2, it is shown that the pink bud spray was not too effective in reducing blossom blight, although it is possible that the check plot would have had more than 28 percent infection had this spray been omitted. "Phygon XL" was particularly effective in allowing only 5.8 percent infection and was significantly better than the other treatments. All of the treatments, however, reduced blossom infection below the check. None of the treatments caused injury, although "Phygon XL" seemed to have discolored a number of the blossoms. For this reason, it was reduced to ¼ pound in the 1950 test, and sulfur 3¼ pounds, was added to give the spray a little more potency.

In Table 3, it is shown that the treatment containing "Phygon XL" and sulfur was superior to sulfur alone, both in the number of blossoms infected and in the number of active twig cankers to develop conidia. Inasmuch as twig cankers are the primary source of inoculum after the bloom period, a small number of such cankers can develop a serious brown rot epidemic providing, of course, weather conditions are conducive to infection. In Table 3, it is shown that the canker ratio May 12 between the two treatments was approximately 1 to 2. At harvest, August 14, the fruit infection ratio between the same two plots was approximately 1 to 3. Thus, canker abundance early in the season has a definite bearing on the severity of fruit infection at harvest.

To summarize, in 1949 and 1950, sprays containing "Phygon XL" were superior to other treatments in reducing blossom blight infection on peaches. By increasing the control of such infection during the blossom period it was possible to retard the rate of development of the preharvest fruit infection.

GROGGINS

(*Continued from page 51*)

mittee a copy of the government's policy statement on exports as enumerated at Paris by Charles E. Wilson, Director of Defense Mobilization. Our exports of DDT and other pesticides should be viewed through the same diplomatic glasses and with the same humane objectives used by federal agencies having responsibilities in this field. We should bear

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What's Coming?

See opposite page →

in mind the motives behind our export programs in improving world conditions and winning friends, as well as markets.

A trade association meeting is not an ideal place for evaluating the importance of our pesticide export program. Here we are well fed and comfortably housed. Thus, it is difficult to picture situations where sickness, disease and malnutrition are the rule. Here, thanks to federal, state and city surveillance and the availability of pest control chemicals and biologicals, we are quite free of malaria, intestinal parasites and typhus. In Asia, Africa and Latin America, however, the chances are overwhelming that one will be chronically sick all his life from these maladies. In this country, we have an abundance of food. We have a balanced diet which may include supplementary vitamins. On the other hand, in most of the countries included in the OIT export program, the chances are two to one that you would be suffering from malnutrition, either from too little food or from food that is not balanced with respect to essential nutrients.

It is not necessary to dwell on the importance of DDT and other chlorinated insecticides in controlling disease-bearing insects and in achieving a greater production of foods and fiber. Member of the insecticide trade know this to be true. You have been busy and successful in selling domestic agriculture on the validity of these facts. A more abundant food supply and a better level of health are, however, more pressing problems abroad than they are here. For this reason, I am suggesting that our pesticide export program should be more than mere trade. Consideration needs to be given to the opportunities for implementing government programs in building up good will and better living abroad. The subject deserves consideration on a high level by the National Agricultural Chemicals Association and its members.

It has been stated that agricultural chemicals is one of the most rapidly growing fields of chemical activity. This is not surprising. It's just a sign that American farmers are achieving technologic and economic maturity. After making expenditures for land, seed, fertilizers and labor, farmers are realizing more and more the advantages of protecting their investment by buying the crop insurance provided by pesticides. Depending on the need for food and the availability of funds, other countries will follow our progressive examples in this field. In reflecting on this hopeful future, it has occurred to me that the term "agricultural chemicals" describes adequately neither the size of the market nor the importance of your activities. Remember, you are dealing with over 5 million farmers, one fifth of our population and an annual cash income of about 30 billion dollars. Remember also, that with your products, man can control the recurring scourges of pests that have destroyed crops and brought famine and pestilence since creation.★★

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Advertisers' Index

Accessories Mfg. Co. ..... Sept.
Agricultural Chemicals, Inc. 98
American Agricultural Chemical Co. 50
Aluminum Company of America ..... Sept.
American Cyanamid Co. ..... Sept.
American Phytopathological Society 92
Andrews, W.R.E. Sales, Inc. 99
Antara Products, Division of General Dyestuff Corp. 54
Ashcraft-Wilkinson Co. 58, 94
Atlas Powder Co. 52
Attapulgus Clay Co. 3

Baker, H. J. & Bro. 26
Bagpak Division, International Paper Co. 16
Bean, John, Division, Food Machinery and Chemical Corp. ..... Sept.
Bemis Bro. Bag Co. 12
Betner, Benj. C. Co. ..... Sept.
Bradley & Baker 95
Buffalo Turbine Agricultural Equipment Co. ..... Sept.

Chase Bag Co. ..... Sept.
Chemical Construction Corp. 80
Chemical Corporation of Colorado 8, 9
Chemical Formulators, Inc. ..... Sept.
Chipman Chemical Co. ..... Sept.
Cohutta Talc Co. 102
Colloidal Products Corp. ..... Sept.
Columbia Southern Chemical Corp. 64
Commercial Solvents Corp. ..... Sept.
Cooper, Wm. & Nephews, Inc. 97
Cox, Dr. Alvin J. 104

Davison Chemical Corp. 78
de Ong, Dr. E. R. ..... Sept.

Emulsol Corp. ..... Sept.
Ethyl Corp. ..... Sept.

Flag Sulphur and Chemical Co. ..... Sept.
Floridin Co. ..... Sept.
Fulton Bag & Cotton Mills ..... Sept.

Geigy Co. 4
General Chemical Division, Allied Chemical & Dye Corp. ..... Sept.
Glendon Pyrophyllite Co. 92

Hahn, Inc. ..... Sept.
Hammond Bag & Paper Co. ..... Sept.
Heckathorn & Co. ..... Sept.
Highway Equipment Co. ..... Sept.
Hercules Powder Co. ..... 4th Cover
Huber, J. M. Corp. ..... Sept.
Hyman, Julius & Co. 17

Innis, Speiden & Co. ..... Sept.
International Minerals and Chemical Corp. ..... 3rd Cover

Johnson, C. S. Co. ..... Sept.

Kalker Chemical Works, Inc. 6
Kraft Bag Co. 10
Koppers Co. 94

Lion Oil Co. 18

Marathon Corp. 86
Marietta Concrete Corp. 15
Mathieson Chemical Corp. 102
McLaughlin Gormley King Co. 101
Mercantile Agencies Export Corp. 100
Michigan Chemical Corp. 93
Monarch Manufacturing Works, Inc. 96
Monsanto Chemical Co. 82
Multsimo Products, Inc. 98

Niagara Chemical Division, Food Machinery and Chemical Corp. ..... Sept.
National Agricultural Chemicals Ass'n. 60
Naugatuck Chemical Division, U. S. Rubber Co. 68
Ninol Laboratories 13
Nopco Chemical Co. 90

Oberdorfer Foundries, Inc. 90

Pacific Coast Borax Co. 24
Panick, S. B. & Co. 14
Pennsylvania Industrial Chemical Corp. Sept.
Pennsylvania Salt Manufacturing Co. .. 21
Phelps Dodge Refining Corp. 91
Phillips Chemical Co. 7
Pittsburgh Agricultural Chemical Co., Division of Pittsburgh Coke and Chemical Co. 22
Potash Company of America 11
Poulsen, A. E. & Co. 62
Powell, John & Co. ..... 2nd Cover
Prentiss Drug and Chemical Co. 23
Private Brands, Inc. 98
Pulverizing Machinery Co. 98

Quaker Oats Co. 100

Raymond Pulverizer Division, Combustion Engineering Superheater, Inc. .. 27
Riedeburg, Theodore Associates 104
Rodgers, George G. Co. 92
Royster, F. S. Guano Co. ..... Sept.

Sharples Chemicals, Inc. ..... Sept.
Shell Chemical Corp. ..... Sept.
Sherwin-Williams Co. ..... Sept.
Southeastern Clay Co. ..... Sept.
Spencer Chemical Co. 25
Spraying Systems Co. 102
Sprout, Waldron & Co. 88
Stauffer Chemical Co. ..... Sept.
Sturtevant Mill Co. ..... Sept.

Tennessee Corp. ..... Sept.
Tennessee Products & Chemical Corp. Sept.
Texas Gulf Sulphur Co. 72
Thayer Scale and Engineering Corp. Sept.
Thompson-Hayward Chemical Co. 84
Titlestad, Nicolay Corp. 100
Tobacco By-Products & Chemical Corp. Sept.
Townsend, Dr. G. R. 104

Union Bag & Paper Corp. 28
Union Carbide and Carbon Corp. ..... Sept.
U. S. Industrial Chemicals, Inc. 19
U. S. Potash Company ..... Sept.
U. S. Steel Corp. 76

Vanderbilt, R. T. Co. ..... Sept.
Velsicol Corp. 70
Virginia-Carolina Chemical Corp. 66

Wiley, John & Sons, Inc. ..... Sept.
Williams Patent Crusher & Pulverizer Co. 20
Wisconsin Alumni Research Foundation 96
Woodward & Dickerson, Inc. ..... Sept.
Woolfolk Chemical Co. ..... Sept.
Woudhuysen, H. L. & Associates 96

Young Machinery Corp. 100

(The Advertisers' Index has been checked carefully but no responsibility can be assumed for any omission)

Summers Personnel Shifts

James E. Totman, president of Summers Fertilizer Company, Inc., has announced the following changes and additions in the company's organization.

Ralph E. Fraser, vice-president and general manager of Summers' operations in Maine for the past fifteen years, has been transferred to the home office in Baltimore where he will assume the position of administrative vice-president.

Fred L. Litty, vice-president-elect of Summers and vice-president of Northern Chemical Industries, will succeed Mr. Fraser as general manager of Summers' activities in Maine and eastern Canada.

Frank H. Totman, a director of Summers Fertilizer Company and president of the A. E. Mooers Company, Houlton, Maine, becomes vice-president of Summers in charge of Aroostook County sales and branch offices.

James C. Totman, assistant treasurer of Summers and formerly assistant manager of the Bangor office, assumes the duties of manager of the Bangor branch. Donald Thompson, formerly salesman, has been appointed assistant manager.

Owen Hannigan, manager of the Houlton, Maine, plant, has been granted a six-months leave of absence.

Kenneth Lyons, Baltimore, has been appointed assistant to Ralph E. Fraser in the Baltimore office.

Howard Miller, assistant secretary of Summers, has been recalled to service as captain in the Field Artillery. He has been granted a leave of absence..

William Rasmussen of Grand Forks, North Dakota, has been appointed assistant to William Stolt, manager of Summers Red River Division, Grand Forks, North Dakota, and Gordon Tollerud, a recent graduate of the University of North Dakota College of Agriculture, has joined Summers as agronomist.

•

J. A. G. Davey Dies

James A. G. Davey, Sr., 64, official of the Davey Tree Expert Co., Kent, Ohio, died September 12.

Tale Ends . . .

HAROLD Noble, VP of S. B. Penick & Co., has found that the U.S. isn't the only place where people are worried about "deleterious residues" in food. A recent letter from Bangkok, Thailand, asked the Penick Co. about the cost of killing rats by "Dethmor," Penick's warfarin product. The angle was, according to the inquirer, that farmers considered a cost of 20 satangs (about 1¢) "bearable," provided they could eat the dead rodents. The question was, are rats killed by warfarin edible?

The letter caused quite a flurry around Penick's stately New York office, and the straight-faced reply dictated by Mr. Noble comprises somewhat of a classic. Warfarin, he wrote, can act as a secondary poison under some conditions, so if the rat consumer eats the rodent *in toto*, that is, insides and all, he had better limit the intake to one or two a day. This is because 75% of the warfarin is concentrated in the animal's liver, with the remaining 25% scattered around in other parts of the body.

However, if eviscerated, the rats could be consumed at the rate of three a day, with a probable limit of sixteen a week.

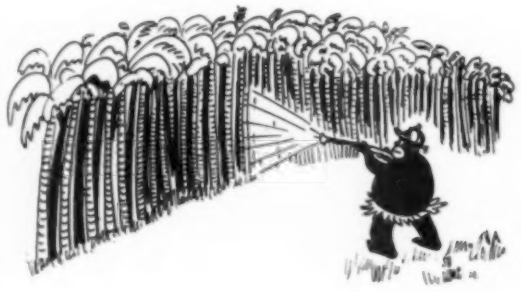
Not that we expect this to become an American delicacy, for it is doubtful that such "foodstuff" could get past the watchful eye of inspectors looking for "deleterious residues" in food.

•

When the freighter *Betsy Olsen* recently arrived in Seattle with a cargo of war surplus from the South Pacific, inspectors discovered the material infested with African snails. Entomologists called in on the problem gave a list of interesting statistics. The snail is about five inches long in its shell and can extend its rubbery body an additional four inches for a total length of nine inches. The snail has 80,000 teeth (we didn't count 'em ourselves) lined in rows along its tongue and can devour a head of lettuce in a night. The snail, a monster as snails go, thrives on all sorts of plant life and could thrive on vegetation in the Pacific Northwest. Another interesting fact for snail lovers is that the beast carries on functions of both the male and female and a single snail, who lays 300 eggs at a time, could give rise to nearly 11 million descendants in five years. The inspector, apparently quite impressed by the statistics, fumigated the ship with a vengeance.

•

Political rumors persist that Rep. James J. Delaney, chairman of the House Committee investigating the evils of pesticides in raising food crops, has his eye on the presidency of New York's Borough of Queens. Well, here's wishing him luck . . . provided, of course, that his election would alter the thinking of his committee in the capital.



Scattershot . . . .

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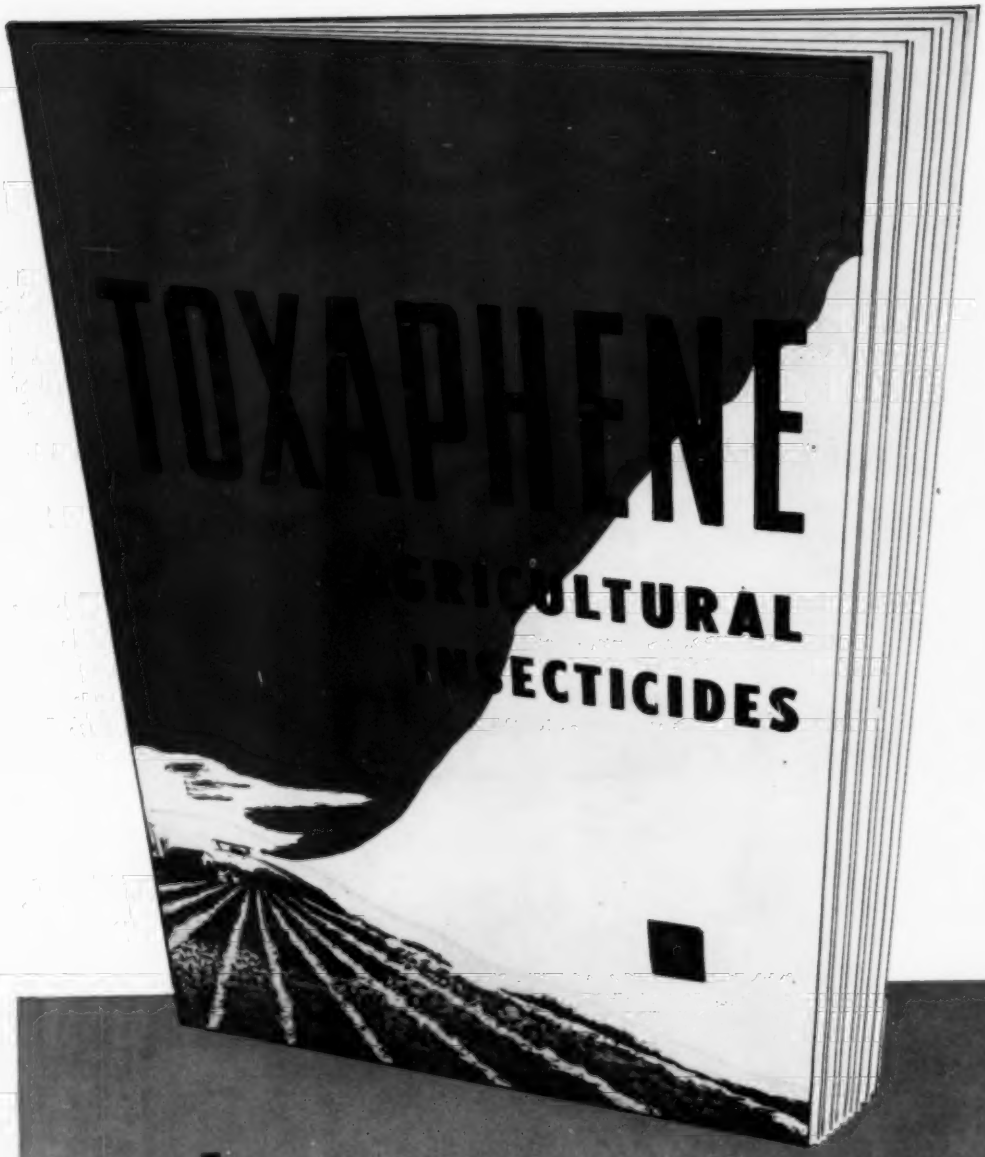

This new, 24-page book summarizes the latest information on toxaphene insecticides, including their use against cotton insects, livestock pests, alfalfa insects, cutworms and armyworms, grasshoppers, peanut insects, and many others. The book also contains valuable information on residues. If you have not received your copy, or require additional copies, write to:

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